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1967-1968

Nevada State Department of Highways

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TWENTY-SIXTH BIENNIAL REPORT

FISCAL YEARS 1967 - 1968

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DEPARTMENT OF HIGHWAYS

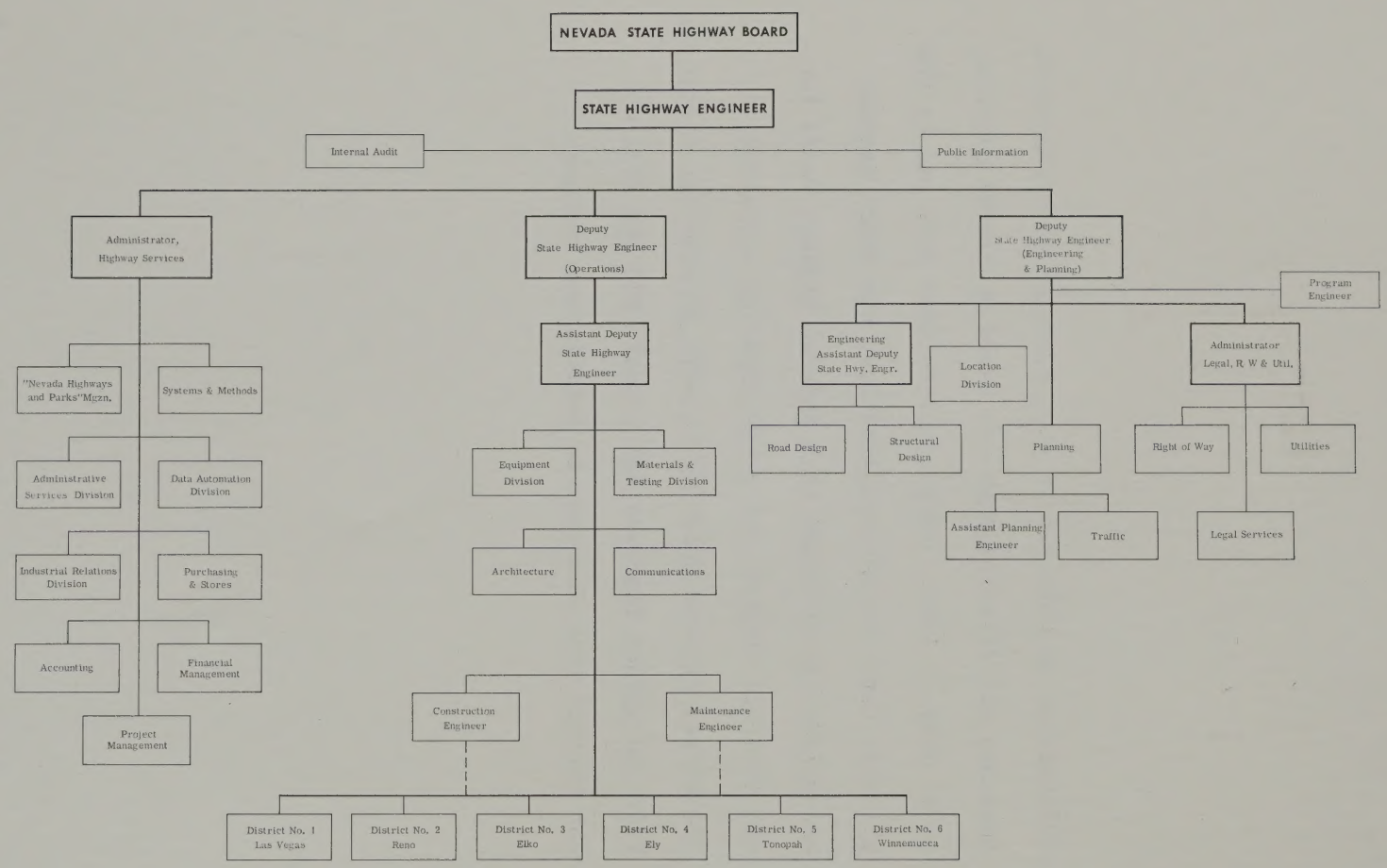
letter of transmittal

To the Honorable Members of
the Board of Directors of the
Department of Highways and
the Nevada State Legislature

The State Highway Engineer respectfully submits this, the Twenty-sixth Biennial Report of the Nevada Department of Highways covering the fiscal years 1967 and 1968.

John E Bauder
State Highway Engineer

NOTE: Information in this report that pertains to anticipated revenues and disbursements was based on fiscal planning as of July 1, 1968. Subsequent to that date and to the printing date for this publication, the State Highway Department was informed that Federal highway funds for the 1969 and 1970 fiscal years might be curtailed. Therefore, figures relating to work program for fiscal 1967 and agency requests for fiscal 1970 and 1971 do not reflect this decrease in anticipated revenue.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November, 1968

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ROSTER OF HIGHWAY OFFICIALS AND DEPARTMENT PERSONNEL

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INTRODUCTION

Despite abrupt setbacks in federal financing, major changes in highway design, and staffing problems, the Highway Department completed the 1967-68 biennium with a record of accomplishment. In the past two years, 55 contracts costing $38.8 million were awarded; 290 miles of asphalt and concrete highway were opened to traffic and construction was begun on another 86 miles of State roadway.

Important advances were made in the areas of highway safety, in the training of Department personnel, in the planning and development of urban transportation facilities, and in the improvement of administrative and engineering procedures. At the same time new concepts and methods were adopted in such activities as materials research, traffic studies, right-of-way acquisition, employee and public relations, and computor programming.

These accomplishments overcame such major obstacles as cutbacks in federal-aid, loss of key administrators, shortage of engineers, and growing demands for improved service. Between July 1, 1966 and June 30, 1968, the Department received $67 million compared to $80.6 million during the previous biennium. The organizational structure was changed considerably due to personnel changes in more than a dozen key positions, including deputy highway engineer, chief testing engineer, assistant deputy engineer for design, chief road designer, traffic and urban transportation planning engineers, construction engineer, and district engineers. Public demands for increased roadside facilities and expanded provisions for highway safety required shifts in the assignments of funds and manpower. Major modifications had to be made in design concepts and project costs had to be increased.

In spite of these problems, over 60 miles of Interstate Freeway was opened to traffic, over $3 million was spent or allocated for expenditure on safety projects, and the relocation of U.S. 50 between Middlegate and Austin was completed. The first major improvement to urban facilities in Las Vegas and Reno were accomplished, a full-time program of urban transportation planning was undertaken, new data processing equipment was acquired and programs developed which greatly improved the Department's ability to handle complex engineering and administrative problems.

Continuing to modify and upgrade its management practices and procedures, the agency adopted many new policies relating to administration, construction, right-of-way and utility programs, research, and design. New manuals were published by various divisions; supervisors received management training; new coordinators and administrators were appointed; and several organizational changes were made in administrative areas.

Although there was no indication of what direction the highway program may take in the future, it is evident that there will be no decrease in public demand for more and better highways. Federal support of road construction will continue to be the most crucial item to be considered. As the biennial period closed, it appeared that problems with the Highway Trust Fund will continue with the resulting cutbacks and freezes of Federal-aid. However,

Department planning hasn't ceased nor will it. The Interstate Freeway system must be completed; improvements must be made in the present Primary and Secondary highways; and massive expansion of the urban facilities has become a necessity. Within the funds available, Nevada will continue to provide the best possible highways for the motoring public.

ADMINISTRATION

Improvement and modification in the administration of the Highway Department continued during the past biennial period. As the roadbuilding program became more complex and demands on the Department increased, administrative activity rose to meet the need.

Through new procedures and equipment, steady improvements were made in the services provided the various operating divisions. Reflecting this change was a reorganization of the administrative division.

With the establishment of an Administrator, Management Services, at the deputy level, various administrative functions under his supervision were organized as divisions: industrial relations, administrative services, financial management, project management, accounting, purchasing and stores, data automation, and systems and methods. The public information officer and his program were made directly responsible to the Highway Engineer. Safety and audio-visual production joined personnel and training to comprise the new industrial relations division. The program engineer now reports directly to the Deputy State Highway Engineer, Engineering and Planning.

Added emphasis was given the importance of management problems through initiation of in-service management training. Middle managers and first line supervisors received a week-long course in management principles and techniques.

A systems and methods division was organized at the close of the previous biennium. Its initial assignment by the Administrator was to develop more adequate descriptions of administrative positions and their responsibilities. Completing this, administrative directives and memoranda from the past ten years were reviewed, and from them was developed a comprehensive series of Department policies. A policy manual was published and procedures adopted for systematic changes and updating of the publication. The division also undertook the study that resulted in the reorganization of the administrative division. As the biennial period closed, systems and methods personnel were beginning research development of a management information system and conducting a highway maintenance management research study

The use of electronic computors was greatly expanded. Remote use of highway data processing facilities was made possible through cable connection with the Motor Vehicle Department. New equipment, which greatly increased the Highway Department's capacity to handle data, was installed. As a result, more divisions and sections began making use of the facilities.

In the upcoming biennium, the administrative program will continue its efforts to expand and improve its services to the Highway Department.

INDUSTRIAL RELATIONS

Personnel

There was a slight decrease in the average total number of career highway employees during the fiscal years beginning July 1, 1966, and ending June 30, 1968, as compared to the number of employees during the previous biennium. The Department experienced a marked decrease of approximately 23% in the number of construction personnel primarily as a result of the curtailment of available federal monies for construction. In addition to the cut-back in federal participation, the Department held the hiring of new personnel in all areas to a minimum. As expected, there was almost an 11% increase in maintenance employees due chiefly to the increase of road miles in our Interstate highway system.

Recruitment of personnel in specialized areas such as structural engineering and drafting continued to be difficult. Newly graduated civil engineers have also been extremely difficult to attract. Entry level maintenance, clerical and technical engineering classes are perpetually being sought as a result of employee turnover and promotion. Five hundred seventeen new appointments were made during the period of July 1, 1966, to July 30, 1968.

During the past biennium, 99 classification studies were conducted and 19 new classes established.

Employee turnover continued to be prevalent among the maintenance, clerical and subprofessional engineering classes. A total of 472 employees terminated from the Department between July 1, 1966, to June 30, 1968, of which 22 were dismissed.

Training

The 67-68 biennium saw an expansion in the Department's formalized training programs. Courses were developed for all areas of training and over 185,000 hours of instruction were presented in nearly every facet of highway activity. Emphasis was divided between the instruction of field engineering personnel, and right-of-way and maintenance personnel. Classes were given in Surveying and Measurements, Highway Materials, Reinforced Concrete Construction, Traffic Estimation, Right-of-Way Appraisal, Negotiations, Legal Techniques, Equipment Operation and Maintenance. The Department developed a management training program for middle management first line supervisors and upper management personnel.

During the 1968 fiscal year the Department received the first graduates of the cooperative civil engineering program presently conducted with the University of Nevada. Eighty percent of the persons who were enrolled in this program and received their Bachelor of Science Degree from the University of Nevada chose to come to work for the Highway Department. During the biennium the junior civil engineer rotating program was instigated. This program rotates the newly graduated civil engineer through all phases of the Highway Department operation prior to assigning him to a permanent position within the Department. This program gives the young civil engineer

a basic knowledge of the overall operation of the Department and assists him greatly in understanding departmental problems as he advances in job responsibilities throughout his career. Four civil engineers completed this program during the biennium.

In the fiscal year 1968 the Department established a cooperative training program with the Elko Community College and the Southern Nevada Vocational Technical Center for technicians interested in securing an Associate of Science degree in highway technology. It is anticipated that this program will fill vacancies and critical shortages in the area of trained technicians. The Department during the biennium increased its after-hours training for engineering personnel who desired to secure professional registration. These programs jointly sponsored with the Department of Vocational Technical Education, University of Nevada General Extension and the Highway Department, have been very successful in assisting field engineering personnel in securing their professional registration. The demand for technical skills and management abilities continues to increase in the highway program. To meet this need it is anticipated that training and the production of training materials also must increase. In the forthcoming biennial period particular attention will be given management training, designed especially for maintenance supervisors. At the same time however, the requirements for upgrading skilled technicians in new areas must be continued.

During the biennium the Department in conjunction with the University of Nevada has sponsored Street and Highway Conferences and hosted a National Seminar for Legal personnel from all the highway departments throughout the United States. In compliance with the National Highway Safety Standards Act the Department sponsored a defensive driving program for all State employees. This program did much to reduce the vehicular accident rate within the Highway Department and the other State agencies.

Safety

The safety section is proud to report the receipt of two insurance rebate checks. One was from the vehicle fleet insurance carrier for $47,185 and the other from the personal injury insurance carrier for $31,458.

These rebates are a direct result of increased safety and training programs. They represent the monetary savings the Department experienced without adding the time saved in fewer hours lost because of injury or vehicle repair time. An additional savings is reflected in a lowering of the personal injury insurance premium from $1.70 to $1.58 per 100 dollars of payroll. Cost savings are only one measure of effectiveness of a safety program.

An award system is being adopted for the most improved safety record.

The addition of six equipment operations instructors, one in each district, is expected to show further safety savings within the next few years. Besides training all field personnel on the maintenance and operations of vehicles, they assist the safety director in accident investigations, inspections and safety promotion.

The general safety committee has been reactivated. Its function will be to establish safety policies and procedures and review all accidents and recommend disciplinary action if warranted.

Audio-Visual

During the biennium the audio-visual section was transferred from public information to the industrial relations division.

A large model of the Bonanza Interchange and the Union Pacific property in Las Vegas was prepared for the legal and right-of-way divisions for use as a court exhibit. It is currently on display in public buildings in the Las Vegas area.

The audio-visual section continued to prepare slide shows for the annual district fairs held in Reno, Winnemucca, Elko, Ely, and Las Vegas. Slides also were prepared for the equipment training instructors on various maintenance operations including mixing blacktop, resurfacing highways, cleaning shoulders and ditches as well as operation of tractors, backhoes and shovels.

The greatest impact made in the past biennium was on the engineering staff in increasing awareness of how audio-visual tools can help the engineer. Such innovations as tape recorders for pre-construction hearings, closed circuit TV recording for traffic studies, slides for documenting safety features of highways and colored slides for progress reports are becoming common practice in the Department as a result of these efforts.

Pre-recorded magnetic tapes interlocked with slide projectors are now used in training and will soon be used for presenting public relations materials to service clubs and schools.

Over the past two years, a large file of slides has been built up in the areas of maintenance, beautification, highway safety engineering, general highway construction, maintenance building construction and bridge construction.

Numerous prepared motion pictures were obtained and loaned for use through the audio-visual section. The use of prepared 16 mm film exhibition to highway employees has expanded to where the Department now has four 16 mm sound projectors.

A pre-recorded tape, slide production and booklet presentation was undertaken for use by schools and service clubs. Entitled, "Trails Across Nevada," the package program traces the development of road transportation in Nevada.

The audio-visual section anticipates a general increase in the momentum of audio-visual activities with the highway engineers increasing the use of audio-visual techniques to meet their legal, planning and engineering requirements.

ACCOUNTING

The accounting division workload continued to expand during the past biennium as had been expected. With the advent of the I.B.M. System/360 computer installation, and the gradual but continuing revisions in programming adapting it to accounting processes, the additional workload was handled with no increase in staff personnel -- in fact, through attrition, the accounting division staff was reduced approximately 25%.

The yo-yo like availability of monies from the Highway Trust Fund for Federal-aid reimbursement has made such reimbursement extremely unpredictable. As a result, the State had to rely to a considerably greater than normal extent on its own resources in order to assure the orderly progress of both Federal-aid and "State only" projects.

The uncertain availability of Highway Trust Fund monies also made the orderly and regular programming of forthcoming Federal-aid projects an extremely difficult task, and the accuracy of the prognosis definitely subject to question. Therefore, in the accompanying work programs for the current year and for the following biennium, the Federal-aid revenue projections were based on the "if" condition -- "if Federal Highway Trust Fund monies are available."

If such monies are not made available, the engineering and construction programs will be curtailed accordingly, in order that total expenditures may remain within the scope of total revenues and reimbursements.

INTERNAL AUDIT

Audit programs developed during the preceding biennium were refined and expanded over the two-year period ending June 30, 1968.

During this period, the Federal Bureau of Public Roads urged the Highway Department to accept full responsibility for auditing its own operations. It was agreed that as the State's overall audit program became operative and acceptable to the Bureau of Public Roads, that duplication of audit effort would be materially reduced.

A major addition to the program was implementation of a maintenance, equipment and stockroom audit review. This was an area that had been neglected in the past. The addition of this program has brought all of the functional operating sections of the Highway Department under audit surveillance.

FEDERAL-AID PROGRAMS

The programs section prepared and submitted to the Bureau of Public Roads detailed programs of proposed projects for the utilization of apportionments for each class of Federal funds. The programs covered preliminary engineering, right-of-way, and construction. These programs were the initial commitment on the part of the Bureau of Public Roads to participate in the proposed project.

The five classes of Federal-aid funds are Interstate, Primary, Secondary, Urban, and Highway Planning and Research. Congress initiated the highway beautification program in fiscal year 1966 which allocated three additional classes of funds to the State. The additional funds are control of advertising, control of junkyards, and landscaping and scenic enhancement.

There were $70,169,965 of Federal-aid funds and $511,419 of beautification funds available for programming during the biennium.

The program section submitted 132 Federal-aid programs (53 in F.Y. 1967 and 79 in F.Y. 1968), and 23 beautification programs (all in F.Y. 1967) during the biennium. The programs obligated $52,687,453 of Federal-aid funds ($17,915,724 in F.Y. 1967 and $34,771,729 in F.Y. 1968), and $493,668 of beautification funds.

There were two employees in the programs section which is the same number employed during the previous biennium. The work load of the programs section remained about the same as the previous biennium. However, the work load would have increased considerably if the State had received beautification funds for F.Y. 1968. Also, the Federal Government announced cut-backs in Federal-aid funds two times in the previous biennium which limited the number of Federal-aid programs submissions and presented considerable problems in scheduling of work. In the upcoming two fiscal years, the Program Engineer will be concerned with developing and expanding the services of the programs section to meet the increasing needs of the Department.

FINANCIAL MANAGEMENT

Financial management maintained a continuing program of revision, updating and initiating financial and related reporting, to meet current and future needs of various levels of management within the Highway Department.

Financial management monthly reporting expanded to include:

a. Yearly work program compared to total expenditures by grouped items, by division.

b. Percent of budget expended by division by operation.

c. Voucher status, all projects.

d. Monetary voucher status, current projects.

e. Contract Control List - C/E - Construction - Programmed - Expenditures - Balance.

f. Management status includes Personnel Distribution - Motor Vehicle Income - Reimbursable Obligation - Highway Expenditures by activities.

g. Compacted monthly publication - both fiscal and calendar operation - includes total gross and net motor vehicle user revenue and registration with comparative month and year operation.

Quarterly reporting included a project cross index - all current highway projects for Department wide use; and quarterly management briefing reports as to overall current and future financial status.

Yearly publication and reports included, "Nevada Highway Department Compendium of Laws - Regulations Relative to Highway Finance and Statistical Information"; additional "Yearly PR Forms Federal Usage"; included all facets of motor vehicle user income, expenditures, registration of vehicles, number of vehicles, number of driver's licenses, and yearly local fiscal reports on fiscal year financial operations of local governmental units below State level, in connection with streets and allied street functions, such as, street lighting, parking meters, storm sewers, and off-street parking. Included were debt service for all indicated type of functions and expenditures by all agencies providing funds for streets and roads in Nevada.

Further, 5-W, evaluate yearly work program related to division activities, projects related to total income, both Federal and State by funding types.

The section established PPBS - Project Program Budget System for future years operation to include a revenue forecasting system identified as current - future income from Federal and State levels and related to projected expenditures, both short term and long range.

During the Legislature a daily legislative bill status report was prepared on all legislation affecting the Highway Department and related agencies.

Liason was maintained between the Highway Department and related agencies regarding revenue.

PROJECT MANAGEMENT

Program management is specifically designed to provide a variety of information on a timely basis to help management plan, execute and control the numerous activities required to build and maintain the Nevada State highway system. The activities encompass a large number and wide range of interrelated activities, which are accomplished by many different organizational units.

Specific applications of the system are to:

Compile data on the status of projects and the amount of work completed by definite organizational units and compare this with predetermined time estimates and identify projects significantly ahead or behind schedule.

Forecast possible problem areas for specific projects, reporting this information to the responsible area for appropriate action.

Coordinate among the various operating divisions relative to their areas of responsibility.

The system is concerned with the work still to be done since this is the only area in which savings and improvement can be made.

All projects awarded during the past biennium were monitored by this section.

Monthly reports were prepared for highway management as one factor for effective decision-making on 43 Interstate projects, 35 Primary projects, and 42 Secondary and Urban projects.

PURCHASING AND STORES

For the past two years the purchasing and stores section has developed in many ways. There has been a general increase in all areas of stock coverage. Specifically, these areas are office, drafting, engineering, reproduction, and testing supplies. A greater assortment of items have been added to the stores to facilitate Highway Department needs. The following figures show the increase in stockroom activity.

	June 1967	June 1968	Total Biennium
Stock Acquisition	120,083.20	123,588.66	243,671.86
Stock Disbursement	97,449.83	98,682.51	196,132.34

Since the last biennial report the section has initiated the use of a stock numbering system. Every item of supply carried in stock is identified by an assigned stock number. This helps in the positive identification of items as stated on requests, and is beneficial in keeping stock records for the storekeeper. As a supplementary aid to this stock numbering system a Stock Catalog was issued showing every item available in the stores. Every division of the Highway Department was issued one for its convenience and use in knowing what is maintained in stores. To keep the Stock Catalog up to date, it is continually revised. New supplements to the catalog showing changes in the items listed are distributed regularly.

The reproduction activity was merged with the reproduction section under the planning survey division as of July 1, 1968. Prior to this reorganization the section had substantially automated certain parts of its work, namely, in the acquisition of a new collator and envelope inserting machine. These machines proved to be of real value and saved considerably in getting work out.

In this coming year study will be made of the possibility of adapting the stock identification system to the highway computer. This will work in conjunction with the current hand posting of stock cards, and hopefully provide improved efficiency and accuracy. Currently the plans are being presented to the data processing division.

Since the last biennial report the position of property inventory clerk was established. Under supervision, he is responsible for receiving, transferring, and disposal of all property items under the purchasing authority of the headquarters purchasing and stores section. A consolidation is being worked out to combine and centralize the property inventory control of both the equipment division and headquarters purchasing and stores. Another recent proposal is for inclusion of the highway building inventory in the property system.

From January through May of 1968 a tour was made of the highway districts and resident engineers throughout the State by the inventory clerk. A new identification tag was placed on each property inventory item.

As of June 30, 1968, the statewide highway inventory of property items was 12,591 items at a value of $2,281,274.48. At present this is excluding those items pertaining to the highway equipment operation.

DATA PROCESSING

In September 1966 the new IBM System 360 Model 30 was installed as planned. This third generation computer system provided larger amounts of data storage on line and larger internal core memories. These computer capabilities allowed the development of more sophisticated computer programs for roadway design, structure design, and analysis, traffic forecasting, accounting and financial reporting.

In November 1966 the Department of Motor Vehicles discontinued its computer equipment, added certain new units to the highway computer system and began using the expanded configuration on a second shift. The Department of Administration began to make some use of surplus computer time on the third shift and Saturdays.

In February 1968 the system was expanded to a Model 40 System by changing the central processing unit to one of higher internal speeds and additional internal core memory. This addition provided for an expanding work load from all users and will allow future planned applications to be developed.

The next biennial will see the development of new techniques in remote data input, remote inquiry and remote conversational problem processing. These techniques are now made possible by newly developed computer connected remote devices such as typewriters and cathode-ray tubes for data retrieval and display.

PUBLIC INFORMATION

Changes in other areas of the Highway Department brought changes to the information program. Decentralization and expansion of services was required to meet the increasing needs of the agency and the growing complexity of the program.

Assistance was provided for every division and section in the Department. In addition to its production of news releases and informational pamphlets for public use, the office directed much of its attention to development of material for employee use. Greater emphasis also was given to supporting the in-service training program and information activity at the district level.

Information office positions were established for the northern and southern Nevada areas with responsibilities assigned to directly assist the district engineers with their information programs. The headquarters staff was reduced to accomplish this decentralization, but with no reduction of activity.

As part of in-service management training a class in public relations was developed and taught by the information staff. At the same time, a week-long orientation on public information activities was initiated for engineers in the rotational training program.

The staff of the photo section was enlarged to handle the increasing requests for photographic service. New photographic materials were produced for training, legal presentations, public hearings, testing and research, right-of-way acquisition, and special planning studies.

Photo personnel assisted in developing use of closed-circuit television for employee training and planning survey field studies. Under the direction of the special studies section, a pioneering effort was made in the use of this equipment for studying motor carrier maneuverability on various types of State highway.

To meet the growing interest of local governmental agencies in highways, the information office initiated a program of providing to city, county, and legislative officials periodic reports of Department activity. A special bulletin was developed for quarterly distribution to these officials.

It is anticipated in the future that efforts will continue to improve public information and public relations activities at the local level. Emphasis also will be given to broadening the services provided by the information office to Department administrators and to highway employees in general.

HIGHWAYS AND PARKS MAGAZINE

Eight issues of Nevada Highways and Parks Magazine were produced during the two year reporting period, as follows:

The issue dated Fall-1966 was printed in 100,000 copies, distributed in July, 1966, and contained 9-2/3 pages of advertisements. The Winter-1966 issue was distributed in October, 1966, printed in 80,000 copies and contained 7-1/6 pages of advertisements. The issue dated Spring-1967 printed in 100,000 copies was distributed in January, 1967, and contained 8-2/3 pages of advertisements. The issue dated Summer-1967 printed in 80,000 copies was distributed in April, 1967, and contained 5-1/2 pages of advertisements. Each of the remaining issues during the period was printed in 80,000 copies, release dates and number of advertisements listed below:

Issue Date	Distribution Date	Pages of Advertisements
Fall-1967	May, 1967	8-5/6
Winter-1967	October, 1967	10-1/6

Issue Date	Distribution Date	Pages of Advertisements
Spring-1968	December, 1967	11
Summer-1968	April, 1968	11-5/6
Fall-1968	June, 1968	9-2/3

The magazine operated during the period as closely as possible within the framework of Department regulations to a commercially-produced magazine -- that is, with the object of taking in revenues from subscription orders, newsstand sales and advertisements. From the time it was established in 1936 until 1964 the magazine was released for free distribution, without any offsetting revenues to the Department. From 1964 to the present it has functioned on a strictly commercial basis as outlined above, and while production costs still exceed net income, profits are gradually rising to the point that some 30 to 40 percent of the operation is now self-sustaining. The objective of the publication remains the same as always -- to tell the Nevada story, through articles and photos that portray its history, points of interest, scenic attractions and activities, in a way that will attract visitors to the State and thereby contribute to the State's number-one industry, tourism.

The publication operates much like any of the larger commercial publications. Subscriptions and billings are handled entirely by the Department's IBM processing system. Distribution is effected by contract with one of the nation's largest agencies, the International Circulation Distributors, a branch of Hearst Publications in New York. Advertising and promotion are currently being carried out, also by contract, with the Publisher's Service Co. of Reno. Layout and technical production is performed by Design Directions of Reno.

As a result of the conversion to a commercial type of operation in 1964, it has been possible to improve considerably the publication with regard to size and quality of articles and photography. Public response to the issues released during the period has been, in general, very enthusiastic.

As this reporting period was closing the staff was at work putting together the largest issue yet produced, a 112-page issue devoted to Nevada business and industry. Anticipated for the issue are approximately 35 pages of advertisements. The editor was working closely in preparing the issue with business leaders throughout the State, chambers of commerce, the Department of Economic Development and other government agencies.

Several issues produced during the period sold in large quantities at special outlets. An issue carrying an article about the Harrah's Automobile Collection, for instance, sold in large quantities at the museum in Sparks. Another, featuring the State Museum, is expected to sell in at least 10,000 copies at the museum in 1968-69.

Interest in the magazine has also been indicated on the part of other publications which have reprinted various articles. True Magazine, for example, in an issue expected off press in the fall of 1968, will reprint, in color, an article on antique Nevada tokens carried in this magazine's Winter-1966 issue.

Nevada Highways and Parks is taking an active part in a national organization of magazines of the same type; Vermont Life and Arizona Highways, for example, also being members. Called the Regional Publishers Association, the group will hold its annual meeting in Las Vegas, in November 1968, with about 25 magazines to be present from all parts of the country and Canada.

COMMUNICATIONS

During the past two years improvement of mobile radio equipment has been a major activity of this division. The mobile fleet was increased from 420 to 520 units. The Sober Peak repeater was activated in 1967, to improve coverage between Las Vegas and Tonopah. Montezuma Peak site near Goldfield was developed in conjunction with the Highway Patrol and a five channel point-to-point system nearly completed, linking Las Vegas, Tonopah, and Carson City. Two channels on this system will be allocated for use of the Department, for long range mobile-to-mobile communication. Civil Defense supported the Department communication program in the amount of $100,000, which permitted improvements on Sober, Austin, Eureka, and Highland peaks. Equipment was procured for these locations and those repeaters will be operating in the summer of 1969. Multichannel equipment was procured to link Ely, Eureka, and Austin to serve in the initial development of long range mobile-to-mobile service. This program will overcome the present weakness of the system which requires communication by relay through a dispatcher when high terrain lies in the line of sight path between mobile units.

Design and specifications for the Emergency Calling System to be installed between Fernley and Lovelock were completed. This program required Federal approval and the last major design goals were agreed upon in May 1968. It is hoped that this new facility will be operational in 1969.

A cable facility was constructed connecting the Department of Motor Vehicles and the Department of Highways computing facilities, during this reporting period.

The communications division worked closely with the county commissioners and television boards in Lander County in the development of a mobile radio facility and TV translator site, in the vicinity of Mt. Moses, 40 miles SW of Battle Mountain; the development of Prospect Peak near Eureka for a similar facility with Eureka County and for expansion of the Cave Mountain site near Ely with the White Pine television commission. Winnemucca Mountain was abandoned by the Air Force, and plans are being initiated to gain title and

right of way to the present roadway and improvements on the site, to support future site requirements.

Procurement was initiated to equip Mt. Moses and the Toulon Mountain site with multichannel equipment. This multichannel system will connect Carson City, Reno, Lovelock, Austin, Eureka, and Ely, and should be operational in 1969.

Staff Support for the Office of Civil Defense resulted in communication plans and equipment procurement support for the Office of Civil Defense in Ormsby, Washoe, Nye, Elko, Clark, and Douglas counties and for the City of Henderson. In this staff capacity the communications division is preparing a communications plan for the Department of Motor Vehicles to support a proposed program relative to the "Omnibus Crime Control and Safe Streets Act of 1968." This is a comprehensive State plan for mobile radio and point-to-point services between State Highway Patrol and county sheriff offices, and incorporated town police headquarters.

PLANNING SURVEY

Planning activities and responsibilities continued to expand during the past two fiscal years.

As during the previous biennial period, planning survey included activities such as road inventory, road life, traffic, special studies, cartography (mapping), geodesy, photogrammetry, planning data processing, flight operations, and urban transportation was established as a separate section. Financial activities were carried on by personnel of the financial management sections.

The third cycle of statewide road and street inventory continued during the biennium. Approximately 4,000 miles of roadway on the State's Primary and Secondary system were rated during each of the two years of the biennium as in the past for condition, safety, and service.

County general highway maps were prepared, and additional traffic flow maps were produced.

Work continued on both the Truckee Meadows Urban Area and the Las Vegas Valley Urban Area Studies.

Inventory - Road Life

The third cycle of reinventory of the rural road system was in progress with one man working full time on the project. Churchill County was completed, and Esmeralda and Mineral were in the process of being inventoried during the biennium.

The continuing reinventory is necessary since rural roads under the jurisdiction of local agencies are constantly being improved, realigned, or shortened and, in some cases, abondoned through disuse. Changing of culture features, the extension of corporate limits, and an insistent demand for more accurate maps are all factors necessitating a continuous reinventory.

Streets in most of the cities have increased in mileage. The total street mileage in 1960 was about 880 compared to 1,340 miles in 1967.

Streets of all incorporated cities and all unincorporated towns of 1,000 or more population are inventoried each year for mileage, width, and type.

The data from all of the inventory projects are coded and set up for computer tabulation, the results being used for vehicle mile tabulations and data for other agencies.

The Sufficiency Rating Study, which is a survey of actual existing road conditions as compared with current design standards, is a continuing one on road deficiencies and inadequacies and provides a guide for construction priorities. The data obtained from the study contribute much to the State Highway Department in the preparation of a system of priorities for construction, reconstruction, and maintenance, based on actual physical needs. It provides legislative representatives and the general public with a readily understood, yet scientific approach to the overall highway problem.

Each year the inventory section compiles and publishes the following logs:

1. Federal-aid Interstate System
2. Federal-aid Primary System
3. Federal-aid Secondary System
4. Non-Federal-aid State Route System
5. U.S. Routes and Alternates
6. Status of Road Systems
7. Log of Divided Highways

The inventory section is responsible for the preparation of mileage and cost distribution tables on the Federal-aid Secondary System by county annually. This tabulation is used as a guide for the selection of Federal-aid Secondary Routes and the reconstruction of existing Secondary Routes.

The Highway Needs Study, Functional Classification Study, the placement of mile posts along the Federal-aid Routes, the Scenic Route Study, Interstate Travelway Study, and other studies for the Bureau of Public Roads were completed or, in some cases, have been carried on as continuing studies.

Road life studies include the compiling and publishing of reports distributed on an annual basis to disseminate information concerning the status of state-interest roads. These publications are:

Control Section Index
Control Section Index Maps
Federal-aid Secondary Descriptions
State Mileage Tables

The prime objective of road life during the biennium was to keep current records of the physical aspects and their changes on all state-interest roads. This involved the compilation of factual data on length, width, surface type, year of construction, improvement and retirement records, and cost studies.

Cartography (Mapping) - Graphic Arts

The cartographic section's prime responsibility continued to be the revision and updating of maps to meet current and future needs of the Department, the general public, and other map using agencies. The expanding programs in the Department made it necessary to prepare and produce maps other than those in the regular county, city, and state series.

The cartographic section also produced visual aids and illustrative material of various types to meet the ever-increasing needs of the Department and other agencies. Because it was equipped to handle various problems in visual communications and also because of the effectiveness of the medium, section experience and technical knowledge was called upon increasingly by other agencies in presenting their programs.

During this biennium, the section acquired a wax-coating machine which allowed internal production of paste-up type. This piece of equipment, together with the cold-type composing machine, provided the capability of producing layouts and visuals more quickly and economically.

The cartographic section published many types of maps and related material:

Published a detailed state general highway map published in 1964 and again revised in 1967.

Published general highway maps for Clark County, revised 1968.

Began publication of revised general highway maps for Lyon, Pershing, and Churchill Counties.

Published county traffic flow maps for Churchill, Douglas, Esmeralda, Eureka, Lander, Lincoln, Lyon, Nye, Ormsby, Pershing, Storey, Washoe, and White Pine, as well as the cities contained within these counties.

Published state traffic flow maps and annual traffic report maps.

Published an atlas of maps for the Truckee Meadows Transportation Study Interim Report, in multicolor printing.

Produced maps for the Las Vegas Valley Transportation Study. The section is in the process now of producing a series of maps for this report which will combine the use of aerial photographs and maps. The production of this series will provide a high degree of legibility and communication for the users of the Transportation Study. This makes a "first" in the application of this technique for this purpose.

Produced displays, maps, and other material for public hearings conducted by the Department for the relocation of highways in various locations throughout the State.

Produced material for inclusion in the official road map.

Produced the semi-annual report maps in five overprint colors.

Produced a series of three jurisdictional area maps with color overlays.

Many types of reports and graphic work were done, including: maps for the Sufficiency Rating report; microwave relay maps; beautification cost study maps; construction schedule and construction bulletin maps; route selection maps for Public Lands Funds; truck weight study material; origin-destination study material; accident and speed study material; training visual aids; Civil Defense charts; charts for the Fish and Game Commission, Retirement Board, and other state agencies.

During this biennium, large illustrative charts were produced which the Governor used to supplement his report to the Legislature on the budget. These charts very effectively and graphically communicated the message and were the forerunners of similar material which were subsequently produced for other agencies. The potential applications in this field are just being realized.

The cartographic section, because of its unique position of maintaining the latest techniques in visual communication, whether by maps or other materials, materially contributed to the effectiveness of the Highway Department message and public information.

The Department and other agencies, realizing the importance of graphic presentations, called upon section talents in solving their communications problems.

Development continued on new means of drafting and drawing techniques which materially benefit the Department and increase its productivity.

Traffic

Traffic data for the rural roads and city streets of the State continued to be an important statistical tool for the highway designer and the general public.

To continue the policy of making available current traffic statistics, forty-one sites were continuously counted at strategic locations throughout the State. These counting stations provided hourly, daily, and monthly traffic information for the relationships and expansion factors of other seasonal counts at over 1,800 locations on Nevada's state-interest road systems. These data were further supplemented by year-long traffic inventory of rural roads and city streets in the counties at an approximate five-year interval. During the past biennium, Elko and White Pine Counties were updated, and a traffic inventory begun in Clark County.

In addition, several short-time studies were accomplished for the purpose of determining classification information, justification of traffic control devices, and many other specific traffic studies for various highway design proposals.

Annual reports of the section were the Annual Traffic Report with its recapitulations of traffic statistics on an annual daily basis, and the Tabulation of Annual Traffic Census, listing data for the month of July.

The most significant new equipment added to the traffic section during the past biennium was the Inductive Loop Detector Counting System. This system consists of a wire loop carrying a predetermined frequency signal embedded in the road surface. A vehicle passing over the loop changes the inductance and therefore the frequency of the signal. This change is detected, relayed to the counter, and recorded. Loop detector systems are especially valuable in areas where heavy snowfall is common and hoses would be damaged by snow plows.

Special Studies

Activity in the field of traffic engineering and research continued on the uptrend for personnel of the special studies section during the past two years.

Although areas of responsibility have not been assigned to individual state agencies under the National Highway Safety Act, this has not reduced the effort in safety from the Highway Department's standpoint. Safety improvement projects have increased in number and updating the inventory of hazardous locations has required a great deal of accident research. Likewise, an effort has been made to evaluate effectiveness of safety improvement. Through the use of photographs provided primarily by the Highway Patrol and on-the-site inspection, each fatal accident has been analyzed for clues associating accident causation with highway features and fixed objects. This has resulted in pinpointing sections of highways requiring improvement or modification.

The special studies section is presently coordinating safety activities in the Highway Department with the State Safety Coordinator who is with the Department of Motor Vehicles. This has consisted primarily of determining what is needed to implement the requirements of the Safety Act and to assure Department compliance to the extent possible. Information needs of all divisions within the Highway Department have been determined and a written report submitted to the coordinator. Work also continued on the Interstate Accident Study test section on Interstate 15 and reports on same were submitted to the Bureau of Public Roads. Published was the first statistical report on statewide accidents by any state agency, and it was well received.

Accident data for 1966, 1967, and part of 1968 have been processed for automation which will save countless hours in future analyses. The section experimented with the use of aerial photos in plotting accident locations which is a major improvement over the conventional straight-line diagram.

Personnel from the section have represented the Highway Department at safety management conferences and various inter-agency meetings.

A four-hour course in traffic engineering was prepared and presented to new patrolmen at the Nevada Highway Patrol Academy in the interest of familiarizing them with operational characteristics of the constructed highway.

Statewide truck maneuvering tests were conducted to obtain data on the capabilities and limitations of truck combinations exceeding 70 feet in length. This was necessitated by passage of S.B. 169, Truck Length Law, which was enacted by the 1967 Legislature. Vehicles exceeding 70 feet in length operate under special permit issued by the Highway Department and must adhere to rules and regulations promulgated by the Highway Engineer. Field tests were documented on video tape and 16 mm film, a copy of which has been loaned to several other states for their review.

In the field of urban transportation, assistance was provided in compiling a report on the results of urban studies conducted in the Truckee Meadows area in 1964. Data from urban studies in the Las Vegas Valley were coded for IBM processing and final checking and editing nearly completed. Updating parking facility inventories in both areas continued on an annual basis.

A report was compiled on the possible relocation of U.S. 93 in the vicinity of Hoover Dam and contained several recommended alternate plans.

Data for determining typical section on each proposed construction project were provided to the design division. This field, expanded, was necessitated by the fact that Nevada was contemplating using concrete for paving in rural areas for the first time. A new formula has been developed for rigid structures (concrete) and the special studies section through application of various data provided information which stipulated the most desirable typical section to be used in designing the roadway.

The section continues participation on a panel with other highway staff members presenting the Department's views and findings to the public at formal public hearings.

Acquisition of a radar speed timer has resulted in stepped-up activity sampling vehicle speeds. Data from the studies were used in determining need for speed control, accident preventative measures, and assisting other agencies in their area of responsibility.

An origin and destination study was taken near Schurz, Nevada, to aid in the intersection design at the junction of U.S. 95A with U.S. 95.

Through combined efforts of the districts, internal auditing, and this section, recovery of damages to or destruction of state property is being effected.

Annual studies were carried on as part of the normal routine. The demand for special information on tourism, population, and economic trends increased considerably, and a great deal of time was spent answering the needs of consultants under contract to the National Highway Safety Bureau.

Personnel of the special studies section participated as committee members for the Nevada Outdoor Recreation Plan and the Nevada Planning Council which deals with population estimates and projections.

Reproduction

During the biennium, reproduction handled the requirements of the many sections involved in highway design. The majority of such requests emanated as in the past from roadway design (Interstate, Primary, Secondary, and Landscape) and from the planning survey and right-of-way divisions.

The function of the reproduction section is to assist in streamlining operations of the engineering service division, providing facilities for printing, aerial processes, reproducing photographs, maps and plans, offset operations and photo-drafting. All jobs are grouped into classes. Work is limited by sheet size and minimum printing area of the machines.

Reproduction processes and materials continue to make tremendous advances, which points up the need for interrelationship between the origination of an idea, its placement on paper, and its dissemination that ties the designer, engineer, draftsman, and reproductionist into an integrated team.

With this cooperative attitude in mind, management has effected the combining of the reproduction activities as one reproduction section under the planning survey division. As a result of this merger, the reproduction section has advanced to a position where it can usually work out all reproduction needs with its combined skills and equipment.

Geodetic Section

During the biennium, the geodetic section was involved in the following projects:

1. County Mapping

Additional control data was supplied to the cartographic section for final updating of Clark, Lyon, and Pershing counties. Control data was supplied to the cartographic section for the updating of the Mineral, Esmeralda, and Churchill County maps. The control for the Elko County maps is now being processed.

2. Aerial Surveys

Control work for aerial survey contracts 24, 25, and 26 was undertaken and completed, and all secondary control checked.

3. Interstate Control

Correlation of Interstate alignments completed during this biennium to the existing USC & GS control along the route was accomplished.

4. Location

Additional control and computations on the North-South Freeway and Interstate 80 alignments in the Reno and Sparks area were done for the facilitation of stakeout. The section checked and correlated level data on Interstate 15 in Las Vegas preliminary to construction; tied highway maintenance property in Wellington, Nevada, to the land grid net and correlated the highway alignment to this data; set and computed control for the relocation of U.S. 93 near the Lincoln-Nye County line and computed an approximate crossing of the highway alignment; tied and computed all land grid points found in the vicinity of aerial survey contracts 24 and 25; set and computed control for the location of Federal-aid Secondary Route 681 in Ormsby County; and completed various short-term projects such as bearing checks, corner ties, traverse computing and checking.

5. Files

The control data files were generally updated. Upon accepting the recent request of the Army Corps of Engineers to join ESSA in its data control file for this state, the control files of the control set by the geodetic section were arranged into a more formal system to facilitate the updating of the data.

6. Statewide Microwave Study

Many various control stations were set to further the proposed microwave links throughout the state. Data were taken and computed for the proper acquisition of the property on which the station rests.

7. Miscellaneous Projects

Many general control computations were accomplished, as well as various mathematical problems such as the extension of the design tables for the 18 kip load factor.

Planning Data Processing

This section is responsible for all applicable data processing activities between the various sections of the planning survey division and the data processing division.

To achieve this goal during the biennium, this section has had the additional responsibility of converting from the existing 1401 and 1620 computer systems to the System/360 computer system with its new associated languages and concepts. The conversion has been successfully accomplished for most of the existing computer programs and for new requests for programming effort.

The vast majority of the work was concerned with three sections -- special studies, traffic, and urban transportation. A partial list of their activities would include: monthly and annual traffic reports, truck weight studies, accident reports, speed studies, tourist studies, 18 kip applications, urban transportation studies for both the Truckee Meadows and Las Vegas Valley urban areas, and special one-time-only reports or studies on request.

The largest studies are the Truckee Meadows and Las Vegas Valley urban studies, both of which consist of more than 100,000 cards. These two major studies as a result of their size and complexity require a major share of time and effort.

Urban Transportation Section

The urban transportation section was established under the planning division in May of 1967. Since that time, substantial progress has been made in both the Truckee Meadows and the Las Vegas Valley transportation studies.

The Truckee Meadows preliminary report was completed in late 1967, and the study itself is in its final stages. At present, three alternate systems for the year 1990 are being analyzed for cost, and they should be ready for presentation to the policy committee of the study area for its consideration and approval in late October or early November.

The final report on the Truckee Meadows Study should be completed, approved, and published in the first half on 1969.

The Las Vegas Valley Study is in progress and at present is in the stages of validity test of data and the development of mathematical models which will synthesize the actual conditions of distribution of trips. By the end of the present calendar year, the section will be in the street and highway analysis phase for 1990 traffic.

The final report for the Las Vegas Valley Transportation Study, which will combine the preliminary and final reports should be completed, approved, and published in 1969.

The major effort in the conversion to System IBM 360 for the urban transportation studies should be completed by the end of 1968.

Photogrammetry

During this biennium, three aerial topographic contracts have been negotiated and completed, one for 58 square miles of reconnaissance route selection mapping, one for 42 miles of design mapping, and one for 0.8 square mile of right-of-way parcel mapping.

A sharp increase has been noted in the number of aerial mosaics required for right-of-way parcel appraisals and court condemnation exhibits, caused by the acquisition of right-of-way phase of the Interstate System entering the more populated and resultant more frequent parcel areas.

Flight Operations

During the biennium, a total of 553 hours and 45 minutes were flown by Highway Department pilots in obtaining aerial photographs.

Aerial photography taken by this section was used by the photogrammetry section to compile mosaics for public hearings. These mosaics continued to play a major role in portraying proposed routing and alignment with relation to property and terrain involved, and when displayed throughout the state were favorably accepted by the general public.

Many hundreds of aerial pictures were used by design for the purpose of studying alignment, drainage, and topography. In many instances, vertical aerial photos were transferred to hard copy.

Location continued to use aerial photography in determining the most desirable routing for proposed highways.

Planning survey used numerous high-altitude aerial photographs for map-making and for establishing current street patterns in widely scattered communities.

Right-of-way was a big user of aerial photography. In addition to the use of vertical photography in the study of controversial property evaluations, it is important to note that the right-of-way division continued to find an ever-increasing demand for aerial obliques. The oblique photographs were used in condemnation suits and proved their value in court on many occasions. For example, during the court trial in Las Vegas (Nevada Department of Highways versus the Union Pacific Railroad), numerous aerial photographs were introduced as evidence in proving property values and damage assessment. Prior to the trial, Union Pacific property, shops, sidings, warehouses, and rolling stock were all photographed vertically from Salt Lake City, Utah, to Barstow, California. It was generally conceded by the legal staff that aerial photography played an important part in winning a fair and equitable judgment favorable to the Highway Department.

Public relations continued to use aerial photographs in informing the public of current construction projects, large structures, and completed four-lane highways.

During the biennium, the Department's Cessna 310 flew a total of 338 hours in personnel transportation. Approximately 71,000 miles were covered with a substantial savings in time and travel expense.

Only thirty days prior to June 30,1968, operational costs were re-evaluated and all departments encouraged to utilize this aircraft in the interest of economy. It appears that utilization of the aircraft for transportation will more than double during the 1969 biennium.

Traffic Engineering

The traffic engineering section is composed of the chief traffic engineer and his assistant, the electrical engineer. This section assists the design division by designing and reviewing proposals concerning highway and intersection capacities, channelization, signing, signalization and highway lighting systems. The traffic engineer is also responsible for establishing speed zones, school zones, and general highway safety.

A total of $329,165.07 of highway lighting and traffic signal systems were designed and awarded during this biennium. The following is a summary of these contracts:

Contract Number	Designation	System	Date Awarded	Amount
1229	I-80 Viaduct (S)	Lighting	9/8/66	$ 3,500.00
1230	4th and Keystone	Signal	9/30/66	5,000.00
1230	5th and Keystone	Signal	9/30/66	4,500.00
1230	Interstate Ramps Keystone	Signal	9/30/66	56,000.00
1231	Highways 91 and 93 - Civic Center Drive	Signal	10/13/66	20,000.00
1235	Highways 91 and 466 - Spring Mountain Road	Signal	12/1/66	15,402.42
1236	Kietzke - Truckee River	Lighting	12/15/66	1,500.00

Contract Number	Designation	System	Date Awarded	Amount
1237	Sahara Ave. & Strip	Signal & Lighting	3/16/67	$24,000.00
1243	FAS Rt. 722 - FAS Rt. 705	Lighting	6/19/67	3,600.00
1250	Wells Traffic Signal	Signal	6/30/67	495.00
1253	Rancho Road & Alta	Signal	8/10/67	10,219.65
1256	Lincoln Hall Drive	Signal	9/14/67	15,514.00
1258	17th and B Street	Signal & Lighting	11/9/67	30,000.00
1259	I-15 & Expressway Str.	Lighting	11/2/67	6,000.00
1268	Sahara Ave. Str. Light	Lighting	3/14/68	22,612.00
1269	4th Str. (Vine, Ralston, Arlington, West & Sierra)	Signal	3/28/68	92,645.00
1269	5th Street & Virginia	Signal	3/28/68	18,177.00

ROAD DESIGN

The roadway design division in the Highway Department is responsible for the preparation of all plans, estimates and specifications for any and all construction, reconstruction and betterment projects let to contract. To accomplish the preparation of plans, estimates and specifications for any given project, it is necessary to coordinate design activities with the functions of other divisions within the Highway Department and correlate various data received therefrom. This includes traffic data from the traffic section, material information from the materials and testing division, right-of-way from the right-of-way division, structure designs from the structural design division, construction procedures, controls and methods from the construction division. Special provisions and specifications are then developed for each project.

The organizational structure of the division remained essentially the same with some minor exceptions. Basically the division is divided into sections according to highway system (Interstate, Primary and Secondary, and Urban). Landscaping continued to function as a separate section. Each section is under the supervision of a competent and responsible engineer who reports directly to the Chief Road Design Engineer. To date this method of organization has functioned very well and has sufficient flexibility to adapt to virtually any type of future program.

During the biennium the division had a major reorganization of personnel and job assignments as a result of several retirements and transfers. In keeping with administration desires to hold down operational costs, the vacancies ultimately created at the engineering aide level remained open. As of July 1, 1968 the division was operating with 93 permanent employees as compared to 102 on July 1, 1966. A minimum rate of personnel turnover was experienced. The problem of securing experienced draftsmen continued to lack solution. Despite reorganization and major changes in design standards, the division was able to maintain a difficult job schedule. A specialized section on hydraulics and hydrology was added to the division. This section is to research data in these fields of engineering, coordinate related work with other agencies and establish drainage design criteria.

The division continued to make increased use of data processing methods and new computer technology. By assigning two highway engineers to data processing and training them in programming techniques and computer language, a very effective liaison between data processing people and the engineering people has been established. Work flow is smoother, the programs available are broader and more comprehensive and the accuracy of results has increased immeasurably. The ability to utilize data processing has greatly reduced the need for engineering aids in the area of repetitious and often time laborious computations.

The division within the past biennium experienced the most extensive change in design criteria to come about in over ten years. The impetus for change is founded in the recent Highway Safety Act. Roadside appurtenances and the geometric roadway section have been given the greatest emphasis. Designers have a monumental challenge ahead of them relative to providing a safe, unencumbered roadside and still retain a semblance of economy in their designs.

During the 1967-68 biennium, the division continued to make extensive use of aerial mosaic strip maps for design, public hearings, and general information for the public. Aerial mosaics have become an invaluable tool in the study of drainage basins, preliminary alignments, and the relationship of proposed highway improvements to adjoining properties, topography, etc. Aerial contour maps are also used extensively in route studies, establishing final alignment, roadway geometrics, earthwork computations, drainage design, and the determination of other design features.

With the knowledge gained through experience, the division during the last biennium has made the most effective use of PERT to date insofar as assessing job status and maintaining schedules. With several modifications in the flow chart and related activities, more realistic schedules are being developed and target dates are being met within acceptable limits.

During the 1967-68 biennium, the division completed construction plans on 52 contracts which included 58 projects (12 Interstate, 6 primary, 6 secondary, 9 primary and 5 secondary of an urban nature, 12 landscape and rest area, and 8 State) at a total construction cost of $37,680,500.

Design expenditures related to the projects listed above, and expenditures for design and engineering under way on future projects amounted to $2,705,000.

This includes $274,600 paid to consultants for completion of design and plans for Interstate construction through the urban sections of Reno-Sparks and Las Vegas-North Las Vegas, and other specialized investigations and reports.

STRUCTURAL DESIGN

The total number of structures constructed or put under contract during the 1967-68 biennium were 53. (10 on I-15, 30 on I-80, 13 on other U.S. and State routes).

The cost of this construction,$5,394,760, an increase of $156,000 over the previous biennium. All of these structures, except two, were complete new construction. The two exceptions were an increasing of waterway by adding three more barrels to a single 10 x 6 RCB in Tropicanna Wash on U.S. 91 south of Las Vegas making it a bridge-size structure, and extending a double 10 x 6 RCB at Galena Creek in Washoe Valley. (A bridge-size structure is a structure having a length measured along center line of roadway of more than 20' between under-copings of the abutments or extreme ends of the openings of multiple boxes). Even though there were not as many structures put under contract in the last biennium, the average length was over twice the length of structures constructed during the previous biennium. The Sparks Viaduct structures are in the length class of the two near Verdi and the two near Deeth, about 1,000'.

The design of several jobs including the tunnel project in Carlin Canyon was stopped because of a shortage of federal funds. However, they are now scheduled to be resumed in 1970.

On Interstate 80 and Interstate 15, respectively, there were 30 and 10 structures built, or under construction as of the end of this biennium, along with four structures on the primary system and 9 on the secondary system. During the same period, structures by county, were: Clark 13, Douglas 4, Elko 6, Eureka 3, Humboldt 1, Pershing 10, and Washoe 16.

At the present time there are a total of 196 structures on Interstate 80 and 145 on Interstate 15.

As of June 30, 1968, designs were completed on 102 structures which have not been placed under construction. These are an accumulation which increased by 15 during the last biennium.

Within the last six months, the foundation section has acquired a drill and hired a driller and now is capable of doing complete foundation studies.

There is more use of data processing in this division, with 18 programs operational at this time.

ARCHITECTURE

The architectural division in the Highway Department is responsible for preparing plans and specifications for the construction of Department-owned buildings of many types. These include garage and repair shop structures, buildings for equipment storage, office buildings, dwellings, motor fuel storage and dispensing facilities, water supply and sewage disposal systems.

In addition, a continuing program of repairs, remodeling and updating of older facilities is carried on.

This division has also designed numerous buildings, shelters, and related items for the safety rest areas.

During the biennium, new maintenance buildings were designed and built at Wells, Elko, Battle Mountain, Ely and Incline, Lake Tahoe. At this time, new testing laboratory facilities are under construction at Elko and at Carson City. Construction is also underway on a complete new maintenance station on U.S. Highway 50 between Fallon and Austin. This facility will be one of the largest owned by the Department.

Plans were completed for a complete new maintenance station at Mount Charleston in Clark County, and a new maintenance station at Emigrant Pass on Interstate Highway 80 near Carlin, scheduled for construction in early spring, 1969.

LOCATION

In the past two years, the location engineer reported the completion of 207 miles of field surveys. In addition to the work accomplished by the Department's two location survey crews, location assignments were handled by construction survey crews during the off-seasons, and by aerial mapping means.

Projects were undertaken in ten of the State's 17 counties. Included were: relocation work on U.S. 50 over Robinson and Antelope summits in White Pine and Eureka counties; location for extension of State Route 38 from Sunnyside to Kiko through Lincoln and Nye counties; location for construction of the Kings River Road Federal-aid secondary 620 west of Orovada in Humboldt county; and location for reconstruction of SR 51 north of North Fork in Elko county.

Location was completed on U.S. 50 in eastern Nevada, on the Kings River Road, on the U.S. 50 widening project at Lake Tahoe in Douglas County, and on U.S. 395 in Washoe Valley. As the biennium closed, crews were finishing work on the Sunnyside route.

RIGHT OF WAY

The right-of-way division is responsible for acquiring all property and property rights necessary for construction of highways. This may also include access rights, maintenance station sites, material sites, radio tower sites, roadside rests, beautification and scenic easements. All purchases must be equitable and fair to both the individual owner and to the taxpayers of the State. To accomplish this, the division works within a complex framework of State and Federal laws and regulations.

During initial study and design of a proposed project, right-of-way personnel work closely with location and design divisions to determine how the properties to be traversed will be affected. Determination of ownership, preparation of property maps, land descriptions, appraisal reports, agreements, deeds and other documents must be completed for each individual property before the right-of-way agent can begin negotiations with the owner. In the majority of cases, negotiations are concluded to the satisfaction of both the property owner and the State. Only a very small percent are referred to the legal division for possible condemnation and most of these are settled before a trial is necessary.

Under the relocation assistance program, tenants and owners, who are to be relocated because of right-of-way acquisitions, are provided with information and assistance in locating a new residence, farm, or business, as the case may be. Relocation payments partially alleviate the cost of moving.

Property management, an activity reinstated in the right-of-way division in January, 1968 encompasses such activities as leasing homes, apartments or businesses during the interim between purchase of the property and advertising for the construction contract, and clearing the land of improvements by sale at public auction or demolition. Sale of excess property is handled by the property management section.

To be sure that the owners of properties affected by the highway projects are kept fully informed, the right-of-way division utilizes every means of communication; ie., news media, personal letters, public meetings, personal contact and the distribution of a recently published colorful brochure.

During the period just past, the division has initiated numerous activities aimed at more efficient and effective use of personnel and equipment. One direct result has been a reduction in staff...from 85 during the previous biennium to 70 at present. Equally important, controls and procedures have been tightened to assure full compliance with State and Federal regulations.

The Market Sales Data Bank is a cooperative effort between the Department and title companies, lending institutions and other agencies concerned with property transactions. Current information on property sold, including type of construction, zoning, and other pertinent information is recorded and reported on a data processing print-out sheet. It is believed these reports will save hundreds of man hours and provide up-to-date, accurate information for use in preparing appraisal reports.

Data processing is also being utilized in preparing a complete inventory of all land and improvements purchased. The microfilm filing system now being installed will provide the three-fold benefit of security, rapid file retrieval, and maximum use of available filing space.

Right-of-way personnel have participated in supervisory and management training programs as well as continuing education in the technical fields of engineering, appraising and negotiating. In addition, a revised right-of-way manual and several instructional booklets were published during this period. All of these have contributed to the over-all aim of maintaining a competent and well-trained organization.

Right-of-way acquisitions for the 1966-68 biennium have totaled 446 parcels containing 2,054 acres of land at a cost of $13,065,342.

UTILITIES

The complexity of utility and railroad adjustments, together with the establishment of new programs, has continued to make new demands of the division. The functions for which utilities has express responsibility are: utility-railroad adjustments, revocable permit processing and utility inspection, outdoor advertising and junkyard inventory and control, beautification coordination and studies, and division office engineering. The division continues to operate from the central headquarters with field offices located in Reno, Las Vegas, Winnemucca and Elko. The staff has been slightly reduced and currently includes 22 employees. Part of the reduction is attributable to transfer of the property management and disposal section to the right-of-way division.

State and Federal laws provide for reimbursement to property holders for utility relocations when evidenced by a prior right of occupancy or when not covered by a State revocable permit. The cost of the relocation is considered reimbursable after deducting therefrom all increases in value of the relocated facility. This means that any betterment and increase in the useful service life of the relocated facilities must be borne by the company in order to insure that the taxpayers' dollars do not participate in any enhancement to the facilities belonging to a profit-making, private enterprise concern. The concept involved is that when a utility is forced to move its facilities to accommodate the public improvement, it is entitled to be left in the same relative position after the public improvement is accomplished as it enjoyed before. There is an obligation to make the utility "whole", no more, no less.

In order to insure strict compliance with all regulations and discharge Department responsibility to all segments of the taxpaying public, it is incumbent that control be maintained over a project from its inception to its conclusion and final payment.

In this respect, the utility division maintains construction inspection, assists in internal auditing, and carefully documents all aspects of the transaction to insure the full measure of federal participation.

During the biennium, utility and railroad adjustments and real property acquisitions amounted to approximately $7,000,000.00. The estimated budget of FY 1968 is set at approximately $1,500,000.00. The decrease in this year's budget is based on the recent transfer of property acquisition activities from railroads to the right-of-way division. The budget reflects utility adjustments only.

It is the responsibility of this division to clear newly acquired right-of-way of all outdoor advertising structures prior to the letting of a particular project, thereby allowing the contractor an unobstructed area in which to work.

This is accomplished by a sign survey during which each outdoor advertising structure is assigned a number, photographed, plotted on right-of-way or construction plans, and the size, type, and ownership noted.

The owner of each sign is then notified by letter of the necessity to relocate the affected structure. Certain stipulations are set forth, the compliance with which will allow the State of Nevada Department of Highways to make reimbursement for expenses incurred through the required relocation.

Upon receipt of the required documentation, along with verification from the utility inspector that the relocation has been completed, a request for warrant is forwarded to the accounting section from this office.

Due to prior experience with the various aspects of the outdoor advertising industry, it became this division's responsibility to conduct inventories of all outdoor advertising structures and junkyards located along the State's Interstate and primary systems as required by the Highway Beautification Act of 1965.

Due to the increasing number of railroad crossings necessitated by the entire highway program, great emphasis has been placed on coordination and negotiations with railroad companies throughout the State. The results have been simplified procedures, increased efficiency, and quicker results. An excellent example of what is being accomplished are the nine railroad crossings, at a cost of approximately 1.75 million dollars, being presently negotiated with the Union Pacific Railroad in the Las Vegas area. These structures, when complete, will provide six entirely new railroad crossings and eliminate three existing at-grade crossings. The Union Pacific, Clark County, North Las Vegas and Las Vegas are all involved in the negotiations and costs of these improvements.

A fifteen (15) week course, comprised of 45 hours of instruction, was conducted by the division with staff members assisting the professionals in the instruction. One supervisor also attended the week-long educational seminar of the American Right of Way Association in Chicago.

The division is currently in the process of developing further fiscal control procedures to insure full federal participation. It is anticipated that there will be increased activities in all areas of endeavor, as well as additional responsibility in the beautification and scenic enhancement areas. In recognition of the rapid expansion and the necessity for constant improvement, the division has embarked on a program of in-service and on-the-job training, as well as making use of specialized instruction.

LEGAL

The legal division consists of a chief counsel and several assistant counsels, who are also deputy attorneys general. Legal research assistants also are employed. The division is responsible for all court action in acquiring property under the right of Eminent Domain and advises the Highway Department in all other matters requiring legal counsel. Since the Highway Department is the largest agency in the State government, questions and problems are infinitely large in number. The chief counsel supervises the filing of all condemnation actions and also reviews all letters of offer made in connection with condemnation matters. The assistant counsels' duties are concerned mainly with trial proceedings along with the occasional assistance of fee attorneys who are appointed special deputy attorneys general. The chief counsel and the assistant counsels are called upon daily for consultation and advice from members of the right-of-way division and the utility division as well as other divisions of the Department.

The only highway legal office is located in Carson City. Since many actual work days may be lost by the attorneys traveling to and from the various counties where the motions or other pleadings are argued and the trials heard, every effort is made to keep these trips to a minimum through use of special deputies, particularly in Las Vegas.

The legal division's time is largely utilized in the preparation and trial of condemnation actions to acquire property for highway purposes. There has been a substantial increase in the case volume during the recent years. Considerable effort has been made by the legal division to negotiate further and settle with the property owner after the matter has been referred for condemnation proceedings. By settling such cases the Department avoids the expenses of trial.

The following chart sets for the amount of litigation during the period from July 1, 1966, through June 30, 1968:

Parcels referred for condemnation:	70
Condemnation cases filed:	61

Condemnation cases pending as of June 30, 1968:	69
Non-condemnation cases pending June 30, 1968:	13
Condemnation cases settled before trial:	33
Condemnation cases settled bytrial:	22

The legal division handles all claims against persons who negligently damage property belonging to the Department.

In addition to suits on the Highway Engineer's bond, the legislative waiver of sovereign immunity has resulted in ever-increasing tort suits against the Department for personal injury and property damage arising out of highway accidents.

The legal division also examines and approves the legality and form of contracts, agreements, Bureau of Public Roads project agreements, and resolutions executed by the Department and also performs the following:

Rendering opinions daily, both oral and written (approximately 250 per year); preparing contracts, resolutions and agreements with the cities, towns, counties, federal agencies, utility companies, independent contractors and other pertinent persons or companies as the need arises, as well as such legal forms as deeds, affidavits, easements, and other miscellaneous forms; and preparing bills for submission to the Nevada Legislature.

In addition to its normal duties of coordination, acceptance, and control of the materials used in the design, construction, and maintenance of highways this division works closely with the construction, design, bridge and right-of-way divisions of the Highway Department; as well as with outside agencies such as various cities and counties, the Indian Service, the Bureau of Public Roads, and various consulting engineers in both a service and advisory capacity.

This division is responsible for the final record sampling program instituted by the Bureau of Public Roads. This sampling program has expanded to the point that the full time of four men is required for this activity.

In the past, two men were able to sample subgrade material; now it is necessary to use three crews of two men each to perform this function. To provide more adequate coverage of the northern and southern portions of the State, the aggregate crews have been increased from two to four.

During the summer construction season the roadbed aggregates section has found it necessary to have men work overtime, not only to handle the increased sample load, but to permit more complete utilization of facilities and equipment.

One man is employed as a full-time delineator to sketch material deposits, determine amounts of materials in deposits, and to maintain records of tests for the description of the materials site in the material packet that accompanies the special provisions for each contract, in addition to functioning as Program Evaluation Research Technique coordinator for this division.

The increasing use of cement treated base has necessitated the training of field crews from the construction division as well as laboratory personnel for routine control and record sampling of the cement content and structural strength of these materials.

Several employees have been assigned to the asphalt section to conduct extraction tests as a part of the record sampling program. These tests determine, from field samples, the percentage of asphalt used and the gradation of gravel in roadmix or plantmix materials used in paving operations. New instruments in this section have "paid their way" in the number of man hours saved.

The bituminous mix design section has enlarged its staff in order to determine the stability of mixtures, void factors, density, thickness, stripping and other factors concerned with the quality of paving materials. From these tests the design information for bituminous mixes is prepared. Also, the pavement on site is examined to determine structural strength, asphalt content, and degree of densification attained by the contractor. Extensive research has been done on the use of various additives such as lime, portland cement and others.

The soils and foundation section has been equipped with apparatus to perform the following tests: unconfined compression, direct shear, triaxial shear with both constant and variable lateral pressure, consolidation and permeability. A test to evaluate the ability of aggregates to withstand wear from traffic, deterioration from oxidation, wetting, and drying has been developed. This test, known as a "Degradation Test" is being applied to Nevada aggregates. Research is being conducted on a more rapid method for determining compaction suitability of the various roadbed components during the progress of construction by use of a nuclear moisture density apparatus and air permeability testing.

The chemical section has been greatly expanded and modernized through the acquisition of instruments permitting the determination of certain elements in minutes rather than hours or days. The Leco Carbon and Sulfur Determinator for the rapid and accurate analysis of steel and other alloys has been acquired. Equipment has been installed to permit the evaluation of paints and related materials. A new method has been developed by this section for the rapid determination of the cement content of cement treated base materials; it is being considered for adoption by the American Society for Testing and Materials and has been presented to the Highway Research Board.

This section has recently been designated to act as a "crime laboratory" for identification of drugs and poisons thus assisting local and state law enforcement agencies.

Considerable work has been done on the evaluation of lightweight concrete aggregates by the structural materials section. A "freeze-thaw" study is underway on aggregate and varying cement contents.

Growth in this division is characterized by more complete and accurate control of the materials used in highway construction and beautification as well as an active and progressive research program.

The assignment of two additional engineers to the section has permitted formulation of a research program on skid resistance, and by assigning an engineer to the nuclear device, the research program is being pushed in that field.

Upon completion of the addition to the laboratory building next year, several new instruments will be placed in operation making the Nevada Highway Laboratory one of the best equipped in the western area.

CONSTRUCTION

During the past biennium, the construction division continued with its policy of increased control and responsibility at the district and project level. This alleviated many problems of communications breakdown.

After a cut-back in Federal highway funds, the construction activity was curtailed somewhat; however, work load began increasing steadily after apportionment of additional funds for roadbuilding. The number of field personnel fluctuated between 338 employees during the construction peak in 1967, and 265 employees which denotes the current figure. The latter figure reflects the cut-back in funds early in 1968. There was a decrease of three employees in the headquarters personnel; however, three new positions were created, those being an additional asst. construction engineer, a building construction inspector, and a landscape specialist.

Division personnel conducted a study and established criteria for equipment rental rates in conjunction with Associated General Contractors personnel. These rates are expected to take effect in the near future.

The Contract Claims Review Board was increased to include the asst. district engineer from District 2 and the asst. bridge engineer. The board now consists of six members, two of whom are construction personnel.

The division, striving for better control on highway projects, completed the rewriting of the Standard Specifications which were put into effect in September of 1968. Personnel have been continually updating the Construction Manual since its inception in 1966, and in order to standardize field office documentation procedures, Part One of a Documentation Manual was also prepared. Part Two is currently being written by office personnel.

Personnel of the division were instrumental in completing a study of permanent duty stations for field personnel. The phase-in period for this will commence in January, 1969 and be completed by mid-1969.

The Department's training program for rotating civil engineers has been completed by several of the students, one of whom has elected to transfer into the construction division for permanent assignment.

Activity in the Department's six maintenance and construction districts in the past two fiscal years reflected the shortage of Federal funds and the increased use of State highway monies. Some 305 miles of highway was built; 60 miles on the Interstate, 92 miles on the primary, and 153 miles on the secondary.

In District One, 11 miles of Interstate 15, less than a mile of primary, and 64 miles of secondary highway were opened to traffic, completing contracts costing more than $11.5 million. An elaborate rest area on U.S. 93-466 near Boulder City was completed, and work on a dual safety-rest facility was begun on Interstate 15, about 5 miles north of the Nevada-California line. In December 1966, major flood damage occurred on State Route 39 in Charleston Park and repairs cost $12,800. Crossovers on U.S. 93-466, the Boulder Highway, were improved in four locations and left-turn storage lanes installed. About 15 miles of fencing was constructed on U.S. 95 north of Searchlight under a cooperative program with the BLM and ranchers in the area. Traffic signals were installed at U.S. 91 and Spring Mountain Road, and at U.S. 91 and Civic Center Drive, and signals were improved at U.S. 91 and Dunes Road.

In District Two, construction was finished on 14.8 miles of Interstate 80, on 31.4 miles of primaries, and on 63.3 miles of secondaries. Contracts involved cost more than $10.5 million. On the Interstate, two new roadside rests and two scenic overlooks were built in Washoe and Churchill counties. New safety rest areas also were completed at Minden and near Yerington. Curb and gutters were improved on U.S. 395 in Gardnerville. Flood damage was repaired on State Routes 27 and 28 west of Reno, on Genoa Lane and Foothill Road near Minden, on U.S. 395 in the Topaz Lake area, on SR 3 near Wellington, on I-80 near Brady's Hot Springs, and on SR 56 at the Carson River crossing. With the completed relocation of U.S. 50 between Middlegate and Austin, the district was able to eliminate maintenance stations at Eastgate and Peterson on the east and west side of Carroll summit. At the same time, district mileage for maintenance was reduced some 61 miles as a result of the new highway being transferred to District Five.

In District Three, nearly 31 miles of secondary roadway was completed during the biennium, involving contracts costing $1.2 million. A major addition was made to the maintenance station at Wells, at a cost of $48,300. A roadside rest was built on U.S. 93 north of Contact. Work was begun on a new lab building in the Elko district yards. A new assistant district engineer was appointed. As part of the Federal beautification effort, a junkyard on I-80 was fenced at a cost of $4,415.

In District Four, although no construction was completed, improvement was begun on 12 miles of primary highway and 4.8 miles of secondary road. These contracts cost $159,582, and $648,757, respectively. An addition was made to the stockroom at the shop in East Ely; a new sand bin was erected on Conners Summit. As part of the highway safety program, backslopes were flattened and the roadway widened on U.S. 6 over Currant Summit, on U.S. 93 south of Pony Springs, on State Route 25 over Panaca Summit, and on U.S. 6 over Sacramento Pass. A portion of U.S. 40 in the Wendover area was returned to District Three for maintenance. An assistant district engineer was assigned to the Ely district.

In District Five, 59 miles of primary highway were opened to traffic at a contract cost of $2,822,000. Completed, too, was a roadside rest at Hawthorne and the installation of rest rooms at that facility. Maintenance made drainage improvements on U.S. 95 at Walker Lake, on State Route 3A in Fish Lake Valley, and on the relocated portion of U.S. 50 at New Pass Summit. Mileage in the district for maintenance was increased from 855 to 978 miles as district boundaries were extended north and west of Austin. For the first time, an assistant district engineer was assigned to Tonopah.

In District Six, 34 miles of Interstate 80 were constructed, involving contracts costing more than $8.3 million. A roadside rest was built on U.S. 95 north of Winnemucca. A contract was awarded for construction of a vehicle storage building at the Battle Mountain maintenance station. As part of the beautification effort, a job was awarded for screening junkyards on I-80 at the Imlay interchange and on U.S. 40 near Winnemucca.

District	Miles Maintained	Average Employed
One (Las Vegas)	843	127
Two (Sparks)	927	164
Three (Elko)	698	96
Four (East Ely)	846	67
Five (Tonopah)	978	70
Six (Winnemucca)	592	56

Maintenance experienced comparatively normal conditions during the short stormy winter in 1966-67, and the mild winter this past year. It was faced with mounting costs due to public demands for increased traffic services, particularly in snow removal and icing controls. Safety spot improvement, rest area maintenance, litter pickup and restricted weed control in urban areas complicated the problems. Safety measures to provide more protection for both the workmen and the traveling public required the use of additional manpower and resulted in a reduction of productive time. Landscaping care was undertaken as a new responsibility.

In an effort to provide better maintenance and greater efficiency, maintenance continued the program of supervisory management training, and expanded the indoctrination training and equipment operating instructing program.

Maintenance costs increased only 1.3% during the fiscal year of 1967 and a 10.7% increase was recorded for the 1968 fiscal year over 1967. The average overall cost per mile was $1,511 in 1967 and $1,680 per mile in 1968. Mileage maintained increased to 4884 miles in 1968.

Additions and betterments were an ever increasing item due to increasing age and traffic loads on the older primary and secondary roads. During the fiscal years of 1967 and 1968, 260 miles were resurfaced while 400 miles were cover-coated with seal and screenings. Costs of all additions and betterments for the same period amounted to $2,226,130. Additional traffic and rest areas both contributed to a sizeable increase in the cost of litter removal.

Considerable money was spent on maintenance contracts to improve existing roads by widening and resurfacing. The following projects were upgraded using 100% State funds.

Contract

1239	U.S. 40	Lawtons to Vine Street	4.933 miles	$ 74,129
1242	U.S. 50	Carson City East	7.617 miles	264,861
1246	S.R. 51	Pine Valley #1	5.422 miles	284,267
1274	U.S. 395	Washoe Valley	7.834 miles	870,792
1276	U.S. 50	Robinson Summit	12.032 miles	133,404
1278	S.R. 51	Pine Valley #2	4.735 miles	208,934

Due to the fairly heavy storms of the winter of 1966-67, snow removal costs increased 20.8% and sanding and salting costs increased 2.7%. Costs of these two items were $538,818 and $217,956. The snow removal costs declined 11.2% to $484,696 for the 1968 fiscal year while sanding and salting increased 22.9% to $282,828. There were a number of small cloudbursts and washouts, with only one major one occurring in December of 1967 on State Route 39 (Charleston Park Road). Costs of repair to this section amounted to $12,800.

As a continuation of the safety program, several roads were widened and resurfaced by State forces. U.S. 93, 91, 466 (Boulder Highway) was extended on the shoulder on each lane from the Charleston-Fremont intersection to Henderson. Four storage lanes and median crossovers were constructed on this same section. In District Two near Silver City, two corrugated metal pipes were installed to eliminate a deep roadway ditch at Devil's Gate. In District Four the backslopes were flattened and the fills widened at several locations on U.S. 6 at Currant Summit to provide better sight distance and wider traffic lanes.

Capital improvements made to the maintenance buildings throughout the State consisted of the following:

Equipment parts storage building in East Ely
Heated insulated sandhopper at Connors Pass
Heated asphalt storage tanks in East Ely
Equipment storage buildings in Battle Mountain
Headquarters laboratory building in Elko
Equipment storage sheds and gas house in Wells

Water wells were drilled at the new Cold Springs Maintenance site and at the proposed new station at Mount Charleston. These stations will be built in the very near future.

The Cold Springs Maintenance Station will be an entirely new station being built because of the relocation of U.S. 50 between Middlegate and Austin via New Pass instead of by way of Carroll Summit. Due to its location, it was thought best to revise the district lines and place this section of U.S. 50 in District Five instead of it being divided between both Two and Five. This change removed 61 miles of road from District Two and added 121 miles to District Five.

As part of the highway training program, eight rotating civil engineers spent their required time in the division. A new position of training officer instructor was created and a man assigned to each district. These men will assist the two industrial equipment instructors in training the maintenance personnel in standard procedures and the maintenance care and operation of all equipment. A number of maintenance superintendents and supervisors attended the California Maintenance Academy at Kingvale, California, for a one week course in maintenance management training. All of the superintendnents attended the Nevada Highway Middle Management Course.

The program of annual superintendents and supervisors meeting was continued and was well received by the men attending them.

One continuing phase of highway safety which was accelerated considerably within the last two years, was the co-operative fencing program. This program is one of fencing the right-of-way through problem areas where cattle become a major hazard. The cost of these fences is divided among the Highway Department, and the BLM, and adjoining ranchers. Two hundred and thirty-eight (238) miles of fence was constructed on this program in the biennium.

No stabilization of maintenance costs can be predicted in the near future due to the increasing labor costs, the public demand for increased traffic services, new areas to maintain such as rest areas and landscaping and the increased roadway to maintain which is not reflected in the center-line mileage, but is primarily the result of the divided highway construction on the Interstate highways and divided expressways. Nevada is not alone in this rising spiral of cost, as the national average on maintenance costs relfects an annual 8% increase. It is planned to continue the program of education in management and equipment operation in order to provide a higher standard of maintenance and to hold the rising costs of maintenance to a minimum.

EQUIPMENT

During the biennium, the equipment division initiated several programs to increase efficiency and economy of operations:

(a) Manufactured 100,000 small (4 x 8) sight plates through the use of old large (8 x 24) plates effecting a saving of several thousand dollars.

(b) Established "sub-shops" at Fallon and Wells maintenance stations promoting less down time and reducing travel and labor expenses.

(c) Purchased traffic paint in 55 gallon drums reducing costs of material as well as handling.

(d) Began conversion to fully hydraulically operated sanders in snow removal units resulting in a better control of material as well as a reduction in equipment costs.

(e) Conducted preliminary tests on use of tungsten carbide tipped snow plow blades to determine if savings are possible in this area.

The fleet inventory remained at about 1,730 units.

The budget for the fiscal year 1967 was $2,970,351.00 with 148 employees, and in 1968, was $3,401,840.00 with 152 employees. The budget increase in 1968 was caused by procedural revision whereby the equipment division budgeted for all equipment formerly purchased by the six maintenance districts and all other divisions.

SERVICE AWARDS RECORD

SO – HE STARTED IN 1947-OR 1948

40 YEARS

Eldredge, Reuben E.
Perry, James A.

35 YEARS

Gibson, William H.
Sundeen, Stanley D.

30 YEARS

Deck, Ted
Dube, Paul J.
Gardner, Bill G. (retired)
McDermott, Tony H.

25 YEARS

Bradley, Delile
Christie, H. J.
Indermuhl, Dan
Marriage, Edward G.
Mathews, Woodrow G.
Wise, Roy B.

20 YEARS

Adams, Bruce
Adams, Herbert
Cocking, William J.
Cook, James W.
Dunn, Lawrence
Harris, Scott O.
Jones, Joseph L.
Koskela, Lillian
Marcuerquiaga, Martin
Marke, Roy D.
Marke, Willis E.
McKnight, Stirling G.
McNeill, Lester
Monks, Morris J.
Nagel, William L.
Prina, Victor J.
Quinlan, J. J. (retired)
Robison, Wilford
Spargo, William J.
Stone, Albert A.
Summerfield, William
Terry, Rueben G.
Walsh, Arthur K.
Weidner, Josephine
Yates, Wayne A.

15 YEARS

Atwater, Adrian F.
Barker, Verne
Billett, Arthur E.
Black, Charles C.
Bleak, Oliver
Bundy, Claude L.
Clough, William J.
Edera, Peter (Jr.)
Forbes, Gloria G.
Ghiggeri, Gasper
Gogenola, Joe
Harris, Simon
Hodge, James C.
Horsley, Lee E.
King, John R.
Kuckenmeister, D. M.
Lequerica, David
Mathiesen, Catherine
McGinness, Joe
Mills, Gloria N.
Pradere, Camille M.
Purches, Warren
Shene, Harold N.
Skinner, Howard E.
Westenhoefer, G. B.

SERVICE AWARDS RECORD

35 YEARS

Fell, V. W.
Odell, W. Alan
Parvin, Jack

30 YEARS

Gay, Donald V.
Kinnikin, Margaret W.
McCardle, John E.
Reil, Orvis E.
Rochon, Mary
Ross, Milton F. (retired)

25 YEARS

Chapman, Daniel P.
Cronin, Barry E.
Dillwith, Ned E.
Greenhalgh, Harold J.
Mayer, Henry H.
Muller, Ernest E.
Noteware, Norman D.
Perkins, Clyde E.
Reil, Willis A.
Sharp, Vernon P.
Totman, Beryl
Vega, Aldo M.
Wallace, James D.

20 YEARS

Anrig, Homer M.
Barredo, Albert J.
Carman, Robert S.
Coalter, William J.
Cress, Charles E.
Dalbey, Allan K. (Jr.)
Dales, Clyde W.
Dorsey, H. G.
Herrera, Melchor
Hill, Charles L. (Jr.)
Johnson, Albert W.
Layton, G. Keith
Marochek, Peter
Perondi, Oliver O.
Preece, Ralph C.
Rasmussen, Harold T.
Souza, Joseph A.
Woodgate, A. M.

15 YEARS

Allen, Gerald L.
Anderson, Charles E.
Barkley, James C.
Bass, James B.
Brown, Keith C.
Cole, Darrell L.
Davis, James B.
DePaoli, Tony
Eldridge, Gayus L.
Fanti, Caesar P.
Fialka, Ardean W.
Harmer, Richard H.
Herrera, Rosalio L.
Higbee, Joe V.
Huggins, Macon L.
Hunt, Clawson
Jeff, Harvey
Lacaillade, Harlie D.
Miller, Kenneth A.
Nord, Earnest W.
Page, Frank C.
Park, Raymond A.
Quilici, Frank
Shannon, Carl W.
Smiley, Lulu C.
Spurbick, Dorothy O.
Waltz, Charles W.
Westall, Alfred H.
Ynchausti, Tony

RETIREMENT

JULY 1966 TO DECEMBER 1966

Anderson, Ivan F.
Bradley, Delile
Dulion, Henry C.
Edwards, James J.
Elliott, Emerson
Gardner, Bill G.
Garrett, James L.
Gobeli, Fred
Green, Lowell A. (Disability)
Kispert, Harold G.
LeCroy, O. E.
Manhire, John T.
McDonald, Margaret D.
Mills, Raymond H.
Nauman, John B.
Quinlan, J. J. (Disability)
Ritter, Frederick B.
Robbins, Paul E. (Returned to NHD)
Rose, V. Dale
Wigchert, John

1967

Baxter, George
Beatty, John C.
Case, Charlie M. (Disability)
Faulk, Lee R.
Frank, Arthur J.
Haberland, Herman W.
Harbin, Guy S.
Harris, Scott O.
Juhl, Harold H.
Kinne, A. G.
Little, L. W.
Ross, M. F.
Smith, Willie

1968

Cox, Arthur C.
Guisti, Attilio S.
Harwood, Dewey S.
Sanders, John F. (Sr.)
Springmeyer, Stanley W.
Walker, Oren W.

DECEASED

JULY 1966 TO DECEMBER 1966

Armstrong, Allan
Johnson, Orrin H.
Jorgenson, Oscar M.
Knobbs, Thomas E.
Knuteson, Bruce A.
Meyer, August P.
Van der Dussen, Herman F.

1967

Beail, Howard
Bowman, Richard L.
Clary, Bryant A.
Folwick, Sigurd
Griffith, George
Gritton, Wesley
Paiva, David
Smithwick, Ira M.
Traynor, James
Worthington, Lester R.

1968

Clark, Herbert (dec. 7-26-68)
Hall, Forest
Jaramillo, Joe T.

AVERAGE NUMBER HIGHWAY DEPARTMENT EMPLOYEES BY DIVISION AND YEAR

	1963	1964	1965	1966	1967	1968
CONSTRUCTION & MAINTENANCE	(919)	(1097)	(983)	(942)	(917)	(937)
Maintenance	375	395	396	398	426	451
Equipment	126	137	137	137	138	140
Construction	365	511	391	344	292	277
Materials & Testing	34	39	43	47	47	53
Location	19	15	16	16	14	16
PLANNING & DESIGN	(256)	(292)	(313)	(330)	(321)	(309)
Road Design	108	112	105	102	105	99
Bridge Design	11	15	16	18	16	17
Right of Way & Utilities	56	82	103	112	110	100
Legal	7	7	9	12	14	19
Planning	74	76	80	86	76	74
ADMINISTRATIVE SERVICES	(89)	(99)	(121)	(129)	(135)	(140)
Accounting & Audit	17	18	22	25	32	30
Data Processing	18	20	19	18	19	17
Office Engineer	6	7	7	7	8	7
Stores, Mail & Files, Custodial	25	23	26	28	27	32
Personnel & Training	4	5	8	9	11	11
Public Information	4	3	6	7	8	9
Magazine	-	5	8	8	6	6
Others	15	18	25	27	24	28
TOTALS	1264	1489	1417	1401	1373	1386

TABLE 1
CONSTRUCTION AND RECONSTRUCTION COMPLETED AND UNDER CONTRACT ON THE DESIGNATED STATE HIGHWAY SYSTEM AT THE CLOSE OF THE BIENNIUM

Type	Miles new construction completed during biennium	Miles reconstruction completed during biennium	Miles new construction under contract at close of biennium	Miles reconstruction under contract at close of biennium	Total
Plantmix	183.708*	106.239	56.666	29.443	376.056

*Includes 2.834 miles of concrete paving.

*Includes 1.681 miles Nevada Forest Highway (State Route 19--Kingsbury Grade) by Bureau of Public Roads.

TABLE SHOWING STATUS OF MILEAGE ON THE VARIOUS "STATE INTEREST" HIGHWAY SYSTEMS IN NEVADA
AS OF DECEMBER 31, 1967

County	Improved by State Highway Department				*State Interest Roads Not Improved By State	Grand Total All Types and All Systems
	Federal-aid Primary System	Federal-aid Secondary System	Remaining State Highway System	Total		
Churchill	171.9	118.0	16.6	306.5	5.6	312.1
Clark	274.7	315.3	29.2	619.2	217.5	836.7
Douglas	48.3	43.5	0.7	92.5	17.5	110.0
Elko	337.3	305.4	14.7	657.4	221.7	879.1
Esmeralda	115.3	106.1	20.9	242.3	15.0	257.3
Eureka	73.2	109.8	-	183.0	123.3	306.3
Humboldt	135.1	174.3	-	309.4	204.2	513.6
Lander	83.3	130.5	35.1	248.9	97.5	346.4
Lincoln	99.5	201.1	-	300.6	91.4	392.0
Lyon	122.5	108.3	-	230.8	87.1	317.9
Mineral	119.1	85.3	0.1	204.5	72.0	276.5
Nye	240.4	280.0	4.3	524.7	298.1	822.8
Ormsby	20.5	19.4	-	39.9	4.3	44.2
Pershing	75.1	87.6	0.3	163.0	230.5	393.5
Storey	0.8	12.1	-	12.9	23.1	36.0
Washoe	72.3	199.2	8.0	279.5	334.5	614.0
White Pine	264.8	160.5	-	425.3	191.0	616.3
Totals	2,254.1	2,456.4	129.9	4,840.4	2,234.3	7,074.7
Type	Mileage by Surface Types and Systems as of December 31, 1967					
A-B Primitive and Unimproved	-	-	-	-	483.7	483.7
C Graded and Drained	-	-	-	-	82.4	82.4
D-E Soil-Surfaced and Gravel or Crushed Stone	-	33.7	20.6	54.3	1,383.2	1,437.5
F Bituminous Surface Tr.	-	5.0	0.3	5.3	21.1	26.4
G Roadmix or Plantmix Surface	1,778.0	2,284.6	108.5	4,171.1	263.2	4,434.3
H-I High Type Bituminous	469.1	133.0	0.5	602.6	0.7	603.3
J Portland Cement Concrete	7.0	0.1	-	7.1	-	7.1
Totals	2,254.1	2,456.4	129.9	4,840.4	2,234.3	7,074.7

* State-Interest Roads are all routes on the State-designated System or Federal-aid System.

COMPARISON OF AVERAGE DAILY TRAFFIC AT AUTOMATIC RECORDERS FOR TEN FISCAL-YEAR PERIODS

	DAILY AVERAGE									
	1958-1959	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967	1967-1968
013110 - Sheckler Lane (SR 61) S.W. of Fallon	-	-	-	-	-	662	647	724	709	746
102A - US 91 and 466, south of Las Vegas	6,340	6,566	6,959	-	-	-	-	-	-	-
031115 - Interstate 15, south of Jean	-	-	-	6,586	6,898	6,872	7,134	7,562	7,951	8,036
120 - US 91 and 93, north of Nellis A.F.B.	2,943	3,932	3,320	3,496	-	-	-	-	-	-
031125 - Interstate 15, east of Apex Interchange	-	-	-	-	3,284	3,517	3,919	3,787	3,701	3,920
032115 - US 93, 95 and 466, southeast of Las Vegas	10,516	11,362	12,135	13,859	19,360	21,278	22,060	22,398	20,975	21,617
032125 - US 95, northwest of Las Vegas	1,787	1,682	1,846	3,476	3,770	4,261	4,595	4,832	4,657	4,624
032130 - US 95, south of Railroad Pass	-	-	-	-	-	814	943	891	902	1,080
032215 - Las Vegas Blvd., south of Charleston Blvd., in Las Vegas	-	-	-	-	-	28,488	28,255	26,986	27,334	28,099
033110 - SR 12, north of Logandale	610	648	682	643	782	783	872	796	775	836
033120 - Sunset Road, east of Paradise Road, south of Las Vegas	-	-	-	-	-	1,612	1,852	1,992	2,246	2,065
035215 - Charleston Blvd., west of Rancho Rd., Las Vegas	-	-	-	-	-	19,360	17,471	16,468	16,817	16,975
037130 - SR 41, northeast of Henderson	-	-	-	-	-	1,346	1,156	1,363	1,482	1,673
107 - US 40, just east of Elko	2,812	-	-	-	-	-	-	-	-	-
071110 - US 40, east of Elko	-	2,188	2,496	2,583	2,898	3,150	3,516	3,643	3,649	3,614
071125 - US 40, east of Wells	1,775	1,779	1,909	1,874	1,875	2,020	2,267	2,482	2,521	2,601
072110 - US 93, south of Contact	-	-	-	-	-	796	837	912	899	815
103 - SR 46, just south of Elko	844	-	-	-	-	-	-	-	-	-
073110 - SR 46, southeast of Elko	-	346	361	354	423	419	546	525	520	566
092110 - US 6 and 95, 5.4 mi. northwest of Nye-Esmeralda County line	-	-	-	-	-	-	-	1,019	969	955
131115 - Interstate 80, east of Golconda Interchange	-	-	-	-	-	-	2,695	2,865	3,113	3,210
132110 - US 95, south of Orovada	-	-	-	-	-	642	675	720	743	753
132310 - US 40, in Winnemucca	-	-	-	-	-	7,344	8,001	7,742	8,104	8,092
133110 - SR 140, west of US 95, south of Orovada	-	-	-	-	-	113	121	130	143	143
151110 - US 40, west of Battle Mountain	1,866	2,055	2,123	2,118	2,325	2,581	-	-	-	-
152110 - US 50, west of Austin	288	300	308	329	366	344	357	343	328	309
172110 - US 93, south of SR 25, north of Caliente	-	-	-	-	-	614	651	646	635	652
193110 - SR 3, south of Yerington	645	503	471	456	544	573	564	584	656	774
232110 - US 6 and 95, west of Tonopah	969	1,093	1,057	1,162	1,363	1,577	1,568	-	-	-
233110 - SR 8a, north of US 6, east of Tonopah	-	-	-	-	-	191	218	255	268	222
233120 - SR 58, southwest of Beatty	-	-	-	-	-	238	275	297	281	284
252115 - US 395, north of Carson City	3,929	4,206	4,433	4,743	5,161	5,490	6,343	7,262	6,917	7,213
252125 - US 50, west of US 395, south of Carson City	3,110	3,439	3,287	3,465	3,790	4,019	4,342	4,969	4,648	4,553
271115 - Interstate 80, west of Oreana Interchange	2,284	2,462	2,575	2,701	2,618	2,727	2,987	3,347	3,524	3,592
273110 - SR 59, south of Lovelock	321	300	284	305	351	354	406	432	433	412
311115 - Interstate 80, east of Vista Interchange	5,045	5,156	5,259	5,421	6,134	6,289	7,261	7,701	7,628	7,655
311125 - Interstate 80, east of Nevada-California State line	4,324	5,186	5,394	6,024	6,352	6,727	7,791	8,817	8,614	8,778
312110 - US 395, north of Reno	-	-	-	-	-	2,589	2,594	3,032	3,083	3,053
312215 - Kietzke Lane, in Reno, west of Coney Island Drive	-	-	-	-	13,837	15,102	17,562	18,078	18,821	18,982
312225 - US 40 (East Fourth Street) in Sparks	-	-	-	-	17,681	17,608	17,112	18,515	17,561	18,207
313120 - Huffaker Lane, west of US 395, south of Reno	-	-	-	-	-	330	340	384	379	460
313130 - SR 34, south of Gerlach	-	-	-	-	296	326	316	330	322	309
313215 - Oddie Boulevard, in Sparks	-	-	-	-	5,213	6,007	7,087	7,136	7,352	7,231
317110 - SR 27, west of US 395, south of Reno	1,135	1,120	1,439	1,519	1,676	1,704	1,878	2,150	1,965	2,121
332110 - US 93 and US 50 Alt., north of McGill	652	685	740	710	827	840	797	794	773	758
109 - US 6 and 93, south of East Ely	930	-	-	-	-	-	-	-	-	-
332120 - US 6, 50 and 93, south of Ely	-	539	558	574	632	636	662	668	624	633
333110 - SR 38, south of US 6, north of Preston	-	-	-	-	-	-	-	143	149	150

BRIDGES AND GRADE SEPARATION SUMMARY

SUMMARY BY TYPE	Number of Structures Built by State Highway: CONSTRUCTED OR UNDER CONSTRUCTION AS OF JUNE 30, 1968	CONSTRUCTED DURING BIENNIUM OR UNDER CONSTRUCTION JUNE 30, 1968	STRUCTURES ABANDONED DURING BIENNIUM	TOTAL AS OF JUNE 30, 1968	Structures on Highway System Not Built by State Highway Department	TOTAL STRUCTURES AS OF JUNE 30, 1968
Plain Concrete	4	0	0	4	1	5
Reinforced Concrete	472	49	1	520	3	523
Structural Steel	42	0	2	40	12	52
Timber	26	0	3	23	0	23
Composite Structures (Reinforced Concrete & Structural Steel)	21	0	0	21	0	21
Prestressed Concrete	27	4	0	31	0	31
Structural Plate Pipe	2	0	0	2	0	2
TOTAL	594	53	6	641	16	657
Total Length of Structures in feet	55,309	9,486	340	64,455	3,213	67,668
Average Length of Bridge in feet	93	179	58	101	201	103
SUMMARY BY PURPOSE						
Bridges over Waterways	365	10	6	369	10	379
Railroad Grade Separation	54	8	0	62	4	66
Interchange Structures	121	23	0	144	0	144
Highway Grade Separation	54	12	0	66	2	68
TOTAL	594	53	6	641	16	657

NUMBER AND TYPE OF STRUCTURE BY COUNTY

COUNTY	BRIDGES OVER WATERWAYS	RAILROAD GRADE SEPARATION STRUCTURES	INTERCHANGE STRUCTURES	HIGHWAY GRADE SEPARATION STRUCTURES	TOTAL
Churchill	36	0	6	2	44
Clark	131	26	46	17	220
Douglas	21	0	0	0	21
Elko	54	10	17	13	94
Esmeralda	2	0	0	0	2
Eureka	13	6	7	2	28
Humboldt	12	4	15	6	37
Lander	9	0	2	4	15
Lincoln	12	2	0	0	14
Lyon	18	4	4	4	30
Mineral	4	0	0	0	4
Nye	15	0	2	0	17
Ormsby	0	0	0	0	0
Pershing	13	1	16	4	34
Storey	1	1	0	0	2
Washoe	35	8	29	16	88
White Pine	3	4	0	0	7
TOTAL	379	66	144	68	657
	PEDESTRIAN CROSSING	TUNNELS			
Douglas	0	2			
Washoe	1	0			

CHEMICAL AND METALLURGICAL LABORATORY

Material Tested	Number of Samples 1967	1968	Total	Number of Tests Each Sample	Total
Fence Posts, Wood	6	25	31	4	124
Fence Posts, Metal	13	33	46	5	230
CMP	294	491	785	4	3140
Barbed Wire	11	25	36	4	144
Farm Fence	4	11	15	4	60
Chain Link Fence	8	22	30	3	90
Conduit, Steel & Plastic	33	58	91	2	182
Timber Burial	—	5	5	2	10
Torget Plates & Guide Posts	2	2	4	8	32
Paint, Contract	17	25	42	8	336
Paint, Traffic	33	28	61	8	488
Water Pipe	28	33	61	4	244
Steel, Structural	59	14	73	5	365
Steel, Reinforcing	366	361	727	3	2181
Cement	104	200	304	10	3040
Wire, Electrical	30	47	77	2	154
Water	7	28	35	7	245
Soil Analysis	25	47	72	5	360
Fertilizers	7	6	13	6	78
Alkali Reactivity	29	31	60	4	240
Structural Plate Pipe	23	6	29	4	116
Spectrographic Analyses	50	88	138	4	552
Adhesives	5	5	10	3	30
Additives	—	2	2	4	8
Miscellaneous	16	27	43	5	215
			2,790		12,664

Note: Introduction of the emission spectrograph in February, 1967 has enabled this laboratory to determine 72 elements in 138 samples (the equivalent of 9,936 separate determinations)in an average time of 20 minutes per sample.

1967 - 1968 BIENNIAL REPORT

ROADBED AGGREGATES SECTION

Material Tested	Number of Samples			Number of Tests	
	1967	1968	Total	Each Sample	Total
Preliminary Pit Samples	839	1,089	1,928	8	15,424
Selected Material Base	---	20	20	6	120
Borrow	184	157	341	6	2,046
Finished Products	97	23	120	5	600
State & B.P.R. Record Samples	315	487	802	5	4,010
Open Graded Plantmix Aggregate	12	5	17	5	85
Plantmix Aggregate	41	28	69	5	345
Roadmix Aggregate	15	4	19	5	95
Screenings	21	4	25	5	125
Blending Material	8	-	8	5	40
Blotter & Cover Material	4	2	6	5	30
Maintenance Material	32	7	39	5	195
C.T.B. (Field)	24	3	27	5	135
Backfill Material	4	2	6	5	30
Special Tests	22	173	195	2	390
Subgrade Samples	800	789	1,589	5	7,945
Preliminary Preparation "R" Values	310	214	524	6	3,144
Three Way Audit Samples	22	20	42	5	210
Miscellaneous Tests for other Sections	25	75	100	2	200
TOTAL NUMBER OF TESTS					35,169

MATERIALS AND TESTING DIVISION
STRUCTURAL MATERIALS SECTION

Material Tested	Number of Samples 1967	Number of Samples 1968	Total	Number of Tests Each Sample	Total
Portland Cement	113	206	319	5	1595
Coarse Aggregate	161	129	290	8	2320
Fine Aggregate	85	112	197	10	1970
Concrete Cylinders	1893	3710	5603	1	5603
Building Blocks	40	158	198	4	792
Building Bricks	0	6	6	2	12
Concrete Pipe	35	29	64	2	128
Rip Rap Stone	5	5	10	1	10
Water for Concrete	8	22	30	2	60
Reinforcing Steel	386	410	796	4	3184
Concrete Cores	36	27	63	1	63
Chair (Re-Bar Spacers)	65	45	110	1	110
Mortar Sand	1	0	1	9	9
Concrete Beams	15	0	15	1	15
Concrete Admixtures	1	4	5	1	5
Bonding Agents	0	1	1	3	3
Drain Backfill	0	3	3	3	9
Expansion Joint Filler	16	21	37	3	111
Air Entraining Agents	0	11	11	1	11
Special Laboratory Study Projects	0	5	5	1	5
Curing Agents	3	1	4	3	12
Total			7,768		16,027

1967 - 1968 BIENNIAL REPORT

SOILS & FOUNDATION MATERIALS SECTION	Number of Samples 1967	1968	Total	Number of Tests Each Sample	Total
Aggregate Degradation	98	81	179	2	358
Calculated Maximum Density	13	32	45	5	225
Compacted Density, Harvard Miniature	13	32	45	4 avg.	180
Hveem Stabilometer, R Value	375	224	599	12	7188
Soluble Salts	239	148	387	3	1161
Subgrades	973	1113	2086	5	10,430
Water Permeability	2	4	6	2	12
Air Permeability on Pavement Surface		255	255	1	255
Natural Moisture, Foundation and Settlement Studies	15	56	71	4	284
Specific Gravity	15	26	41	1	41
Pavement Surface Skid Test		37	37	1	37
C.T.B. (Design)	5	21	26	30 avg.	780
C.T.B. (Research)		9	9	30 avg.	270
C.T.B. (Outside Agencies)	4	1	5	30 avg.	150
Lime Treatment		41	41	2	82
Wash Treatment		12	12	1	12
					21,465

SPECIAL REPORTS

2 Recommendations for Correction of Soft Spots in Roadbed
1 Protection of Metal Pipe against action of aggressive soluble salts
1 Recommended general procedure for preparation & placement of C.T.B.
1 Rippability of Layered Material
1 Compaction Data Evaluation
1 Pavement Component Coefficient Value for 1" Crushed Rock Base
3 104(b)5 Study of I-80 and I-15 of projects Designed Prior to 1963
1 Reevaluation of W.B. Lanes after construction

11

PRELIMINARY ROADBED DESIGN COMPLETED

13 Interstate and Urban Projects
17 Primary and Secondary Projects

30

TOTAL TESTS 21,506

1967 - 1968 BIENNIAL REPORT OF TESTS COMPLETED

BITUMINOUS MIX DESIGN SECTION

Materials Tested	Number of Samples 1967	Number of Samples 1968	Total	Tests each sample	Total
Preliminary Pits	62	50	112	24	2688
Production Samples (Gravel)	62	55	117	18	2106
Production Samples (Bituminous)	28	49	77	4	308
Admixture Blends	2	18	20	20	400
Open Graded & Screenings	9	31	40	4	160
Immersion Compression Tests		10	10	19	190
Water Permeability, Swell & Absorption		10	10	5	50
Research	4	29	33	(vary)	619
TOTAL NUMBER OF SAMPLES			419		
TOTAL NUMBER OF TESTS					6521

1967 - 1968 BIENNIAL REPORT

ASPHALT SECTION

MATERIAL TESTED	Number of Samples 1967	1968	Total	Number of Tests Each Sample	Total
Liquid Asphalts	762	1134	1896	12	22,752
Penetration Asphalts (Asphaltic Cement)	1961	2384	4345	13	56,485
Emulsified Asphalt	224	206	430	9	3,870
Bituminous Mixtures	306	358	664	8	5,312

TOTAL NUMBER OF SAMPLES..... 7335

TOTAL NUMBER OF TESTS 88,419

1967 - 1968 BIENNIAL REPORT OF TESTS COMPLETED

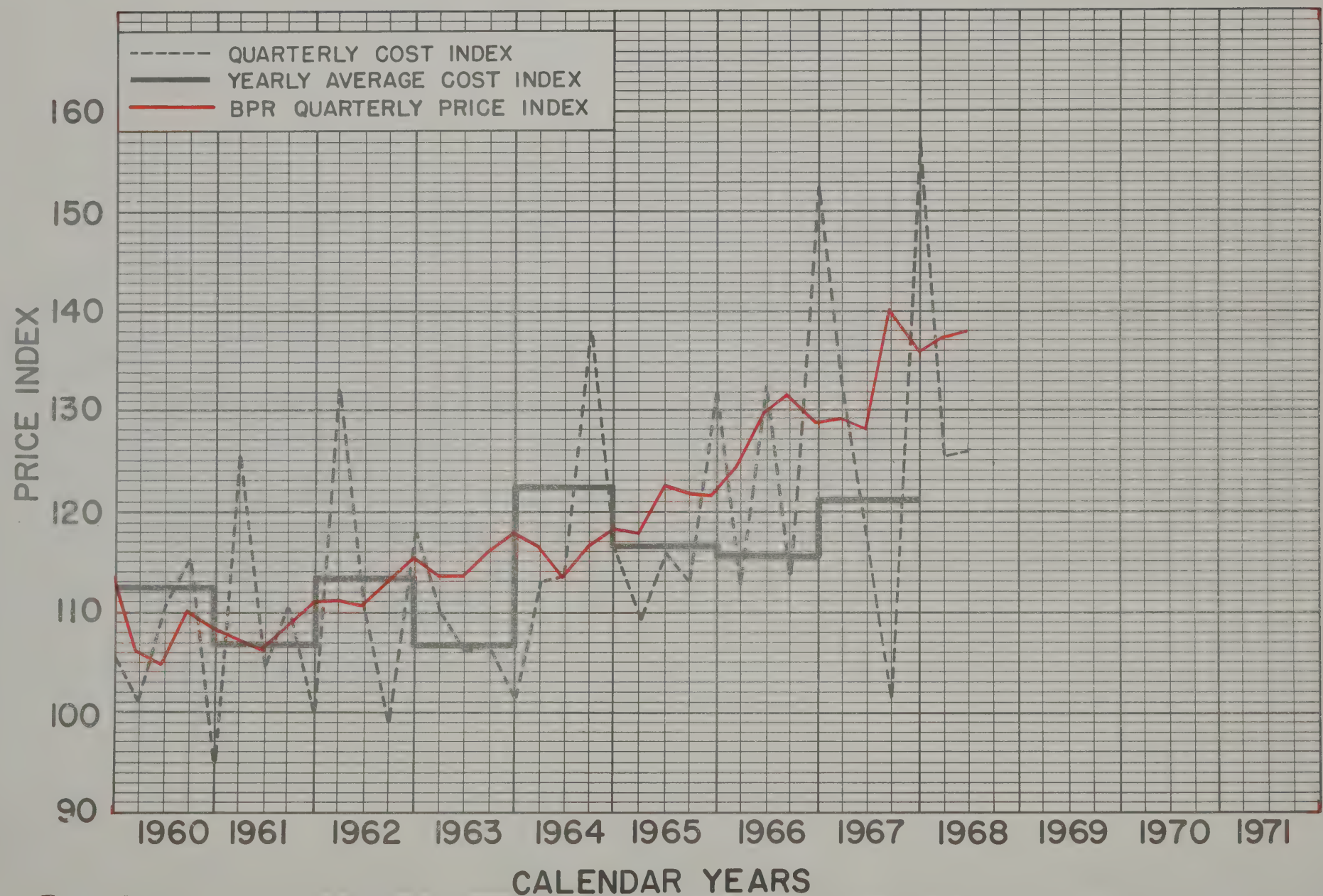
LAS VEGAS MATERIALS AND TESTING

State Finals		90
Concrete Aggregate Total		21
(a) Coarse	12	
(b) Fine	9	
Concrete Cylinders		1515
Asphaltic Cement		121
Liquid Asphalt		86
Emulsions		15
TOTAL NUMBER OF TESTS		1848

STATE OF NEVADA
DEPARTMENT OF HIGHWAYS

PRICE INDEX
CONSTRUCTION COST

1955 = 100



STATE OF NEVADA
DEPARTMENT OF HIGHWAYS
AVERAGE CONTRACT PRICES

Calendar Year	Road Excav. Cu.Yd.	Borrow Cu.Yd.	Type 1 Gravel Ton	Type 2 Gravel Ton	Liquid Asphalts Ton	Plantmix Surface Ton	Class A & Class AA Concrete Cu.Yd.	Reinf. Steel Pound	24 Inch CMP L. Ft.	Composite Index
1955 Average	.388	.219	.660	.869	31.97	2.64	61.17	.120	5.55	100.0
1956 Average	.506	.300	.845	.893	39.86	2.48	78.98	.144	6.08	118.2
1957 Average	.562	.291	.751	.920	39.63	2.96	71.63	.147	6.72	124.3
1958 Average	.535	.241	.683	.813	35.86	2.49	71.37	.142	6.73	113.3
1959 Average	.397	.234	.704	.925	35.18	2.53	66.86	.129	6.61	104.6
1960 Average	.541	.249	.737	.863	33.52	2.41	65.71	.127	6.67	112.4
1961 Average	.437	.350	.797	.884	32.98	2.53	62.61	.114	6.81	106.9
1962 Average	.443	.309	.847	1.037	34.11	2.86	66.36	.116	6.28	113.2
1963 Average	.428	.299	.839	.984	30.73	2.68	63.10	.098	6.20	106.9
1964 Average	.520	.509	.875	1.253	29.98	3.06	67.49	.103	5.85	122.6
1965 Average	.444	.322	.907	1.202	32.69	3.00	70.77	.127	5.35	116.8
1966 1st Qtr.	.472	.372	.845	1.044	27.43	2.78	77.40	.122	5.40	111.3
2nd Qtr.	.612	.980	1.079	1.044	31.47	3.04	64.55	.110	6.59	134.2
3rd Qtr.	.372	.926	.980	1.044	28.17	3.09	58.73	.119	8.70	113.5
4th Qtr.	.552	.288	.768	3.000	33.68	2.92	67.33	.135	7.00	151.0
1966 Average	.461	.610	.915	1.055	29.34	2.92	62.97	.119	6.03	115.3
1967 1st Qtr.	.720	.288	.768	1.250	26.02	3.30	65.00	.115	7.00	132.4
2nd Qtr.	.500	.288	.819	.877	29.73	3.67	74.58	.132	6.65	117.5
3rd Qtr.	.307	.350	.793	.877	33.33	2.87	78.36	.140	7.27	101.9
4th Qtr.	.42	.94	1.30	2.00	34.73	5.69	65.00	.12	6.13	157.46
1967 Average	.41	.81	1.07	1.08	32.81	3.25	67.20	.12	6.44	121.09
1968 1st Qtr.	.30	.37	1.02	2.00	36.34	3.25	79.51	.12	6.52	125.78
2nd Qtr.	.43	.73	1.29	1.23	31.38	3.24	76.81	.14	5.13	125.87
3rd Qtr.	.51	.89	2.28	2.20	21.50	5.45	57.49	.10	6.39	164.61

CONTRACTS AND LETTING

1 July 1966 thru 30 June 1968

56 Contracts and 41 Bid Openings

14 Interstate

12 Primary

5 Secondary

6 Urban

10 State

9 Beautification

Amount of Contract	No. Contracts	No. Bidders
up to $ 50,000	17 (1 reject)	59
$ 50,000 to $ 100,000	6	27
$ 100,000 to $ 250,000	11	43
$ 250,000 to $ 500,000	5	34
$ 500,000 to $1,000,000	7	32
$1,000,000 to $1,500,000	2	17
$1,500,000 to $3,000,000	4	27
over $3,000,000	4	42
	56	
	- 1	
Contracts awarded	55	

281 bids submitted on 56 contracts

Average 5.02 bidders per contract

TRANSPORTATION PERMITS
7/1/66---------6/30/68

		Number Units Moved
Heavy and Highway		4,767
Farm Machinery		654
*Mobile Homes		6,954
Buildings		521
Military		360
Miscellaneous		1,698
	Total	14,974

TRANSPORTATION PERMITS ISSUED

**7/1/66 thru 12/31/66		2,041
**1/1/67 thru 12/31/67		4,315
**1/1/68 thru 6/30/68		2,488
	Total	8,844

* The Legislature of the State of Nevada in their 1965 session amended NRS 484.600 related to "Maximum Width of Vehicles" allowing mobile homes in excess of 8 feet wide and not to exceed 12 feet wide to be moved on their own wheels, provided they meet the test set forth in the amended law which became effective July 1, 1965. The Department of Highways has been delegated the responsibility for issuing such permits, and from the guide lines set forth in the law, established the policy of issuing permits for the movement of mobile homes on a single trip or annual trip basis. A permit issued on an annual trip basis allows the permittee to transport a mobile home as many times as he wished under the authority of one permit. The effect of the law is reflected in the reduction of the total number of permits issued and not in the movements of mobile homes.

** A change in policy authorizes a permit to be issued for a period of six months, which allows the permittee to transport equipment as many times as he wished under the authority of one permit. The effect of change in policy is reflected in the reduction of the total number of permits issued and not in the movement of equipment.

ENCROACHMENT PERMITS

7/1/66 - 6/30/68

	No. Units Issued
TELEPHONE & TELEGRAPH LINES	214
POWER LINES	169
SERVICE PIPE	
GAS LINES	160
WATER LINES	135
SEWER LINES	55
CULVERTS	3
MISCELLANEOUS PIPE	13
APPROACH ROADS AND DRIVEWAYS	214
MISCELLANEOUS	95
GRAND TOTAL	1058

JOB AUTHORIZATION DATA 7/1/66 - 6/30/68

District or Division	Number of authorizations this biennium	Amount authorized this biennium	Amount authorized previously expended this biennium	Amount expended and authorized this biennium	Total Expenditures	Balance of work Incomplete
One	15	229,700.00	56,453.21	184,760.12	241,213.33	11,513.33 OD
Two	70	444,420.00	32,227.10	357,661.75	389,888.85	54,531.15
Three	37	430,200.00	89,471.30	320,791.15	410,262.45	19,937.55
Four	25	587,200.00	145,330.54	328,803.54	474,134.08	113,065.92
Five	28	437,400.00	69,118.47	216,970.83	286,089.30	151,310.70
Six	31	280,200.00	66,573.50	117,286.51	183,860.01	96,339.99
TOTALS	206	2,409,120.00	459,174.12	1,526,273.90	1,985,448.02	423,671.98

Note: Report Covers # 11067 - 11273 Inclusive

TABULATION INDICATING NUMBER OF CONTRACTORS
PREQUALIFIED BY THE DEPARTMENT AT THE CLOSE
OF THE BIENNIUM

RATING	NUMBER OF CONTRACTORS
$ 50,000 to 90,000	1
100,000 to 240,000	8
250,000 to 490,000	11
500,000 to 990,000	18
1,000,000 to 1,490,000	13
1,500,000 to 2,490,000	16
2,500,000 to 4,990,000	18
5,000,000 to 9,990,000	20
10,000,000 and over	42
Total	146

June 1964 there were 110 prequalified contractors

June 1966 there were 123 prequalified contractors

June 1968 there were 146 prequalified contractors

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

DEPARTMENT'S FINANCIAL HISTORY

1917-1968

REVENUES

FEDERAL AID REIMBURSEMENTS	$ 374,743,547.
STATE SOURCES	279,792,087.
SUB-TOTAL GROSS	$ 654,535,634.
LESS USER ADMINISTRATIVE AND COLLECTION COSTS	34,356,449.
TOTAL RECEIPTS	$ 620,179,185.

EXPENSES

CONSTRUCTION	$ 390,301,097.
MAINTENANCE	85,996,917.
RIGHT OF WAY AND PRELIMINARY ENGINEERING	87,831,653.
ADMINISTRATION	47,049,259.
TOTAL EXPENSES	$ 611,178,926.

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

STATEMENT OF RECEIPTS AND DISBURSEMENTS 1967 - 1968

DESCRIPTION	F.Y. 1967	F.Y. 1968	TOTAL BIENNIUM	% of TOTAL
GROSS REVENUES:				
Federal Aid	$42,766,877.00	$24,239,389.00	$ 67,006,266.00	62.48
Motor Fuel Taxes	11,863,162.79	12,696,137.26	24,559,300.05	22.90
Common Carrier Fees	3,298,432.68	3,459,104.79	6,757,537.47	6.30
Auto Registrations	3,303,709.60	3,179,476.05	6,483,185.65	6.05
Driver's License Fees	338,935.62	211,767.65	550,703.27	.51
City, County and other Participation	175,363.38	430,037.68	605,401.06	.56
Miscellaneous Accounts Receivable	760,949.91	528,349.39	1,289,299.30	1.20
Total Gross Revenue	$62,507,430.98	$44,744,261.82	$107,251,692.80	100.00
USER ADMINISTRATIVE AND COLLECTION COSTS:				
Nevada Tax Commission	$ 39,210.18	$ 35,943.55	$ 75,153.73	1.08
Public Service Commission	64,862.36	120,186.00	185,048.36	2.66
Department of Motor Vehicles	3,152,553.45	3,540,143.44	6,692,696.89	96.26
Total User Administrative and Collection Costs	$ 3,256,625.99	$ 3,696,272.99	$ 6,952,898.98	100.00
Grand Total - Net Revenues	$59,250,804.99	$41,047,988.83	$100,298,793.82	
EXPENSES:				
Construction	$26,795,935.50	$26,487,349.49	$ 53,283,284.99	55.23
Maintenance	5,572,089.75	6,146,547.55	11,718,637.30	12.15
Surveys, Plans, Design and Right of Way	13,393,159.15	9,087,014.82	22,480,173.97	23.30
Administration	1,728,272.15	1,879,224.59	3,607,496.74	3.74
Equipment and Plants	473,634.84	866,132.97	1,339,767.81	1.39
Building	160,054.57	152,320.71	312,375.28	.32
Research and Investigation	653,668.91	660,104.37	1,313,773.28	1.36
Highways and Parks Magazine	98,690.13	128,914.37	227,604.50	.24
Annual Traffic Studies	16,120.90	16,705.82	32,826.72	.03
Public Relations	80,353.17	254,454.74	334,807.91	.35
State Road Maps	28,977.71	31,784.45	60,762.16	.06
Accounts Receivable	802,963.57	959,153.35	1,762,116.92	1.83
Total Expenses	$49,803,920.35	$46,669,707.23	$ 96,473,627.58	100.00

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

RECONCILIATION WITH STATE CONTROLLER

F.Y. 1967:

Highway Fund Balance - July 1, 1966	$ 4,675,092.70
Plus: Gross Receipts	62,507,430.98
Less: User Administrative and Collection Costs	3,256,625.99
Highway Direct Expenditures	49,803,920.35
Sub-Total	$ 14,121,977.34
Plus: Expenditures in Transit	717,762.97
Less: Deposits in Transit	9,437.21
Controller's Balance - June 30, 1967	$ 14,830,303.10

F.Y. 1968:

Highway Fund Balance - July 1, 1967	$ 14,121,977.34
Plus: Gross Receipts	44,744,261.82
Less: User Administrative and Collection Costs	3,696,272.99
Highway Direct Expenditures	46,669,707.23
Sub-Total	$ 8,500,258.94
Plus Expenditures in Transit	328,424.12
Controller's Balance - June 30, 1968	$ 8,828,683.06

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

ACTIVITY OF STATE HIGHWAY FUND FOR BIENNIUM

DATE	RECEIPTS	DISBURSEMENTS	FUND BALANCE
F.Y. 1967			
1966			
July	$ 2,950,963.47	$ 4,641,665.79	$ 2,984,390.38
August	3,829,033.18	5,582,985.83	1,230,437.73
September	4,776,147.64	9,328,082.76	3,321,497.39
October	13,680,332.82	3,103,910.09	7,254,925.34
November	1,747,368.57	5,178,816.49	3,823,477.42
December	1,821,612.38	4,478,530.47	1,166,559.33
1967			
January	13,324,761.88	3,087,272.94	11,404,048.27
February	1,678,655.61	3,158,689.77	9,924,014.11
March	2,658,154.74	2,516,916.22	10,065,252.63
April	5,323,333.95	2,271,368.05	13,117,218.53
May	3,067,339.91	2,735,807.91	13,448,750.53
June	4,393,100.84	3,719,874.03	14,121.977.34
TOTAL	$ 59,250,804.99	$ 49,803,920.35	
F.Y. 1968			
1967			
July	$ 96,890.22	$ 3,688,792.67	$ 10,530,074.89
August	3,742,510.95	4,366,806.19	9,905,779.65
September	3,866,682.04	5,003,898.33	8,768,563.36
October	4,144,493.16	4,263,796.79	8,649,259.73
November	4,717,465.87	4,015,000.07	9,351,725.53
December	144,265.13	4,453,333.51	5,042,657.15
1968			
January	4,849,904.85	2,464,124.38	7,428,437.62
February	4,539,213.13	2,825,194.84	9,142,455.91
March	5,025,408.80	3,455,748.26	10,712,116.45
April	1,633,267.46	3,161,638.68	9,183,745.23
May	3,929,824.11	4,609,903.31	8,503,666.03
June	4,358,063.11	4,361,470.20	8,500,258.94
TOTAL	$ 41,047,988.83	$ 46,669,707.23	
MONTHLY AVERAGE - BIENNIUM	$ 4,179,116.41	$ 4,019,734.48	$ 8,232,553.72

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

STATUS OF STATE HIGHWAY FUND FOR BIENNIUM

DATE	HIGHWAY FUND BALANCE	AMOUNT VOUCHERED UNPAID	POTENTIAL FUND BALANCE	CONTROLLER'S BALANCE
F.Y. 1967:				
1966				
July	$ 2,984,390.38	$ 4,500,276.00	$ 7,484,666.38	$ 3,082,313.97
August	1,230,437.73	4,500,276.00	5,730,713.73	3,244,297.63
September	3,321,497.39	5,191,900.00	1,870,402.61	490,585.75
October	7,254,925.34	610,929.00	7,865,854.34	8,956,017.94
November	3,823,477.42	2,034,428.00	5,857,905.42	4,883,084.31
December	1,166,559.33	3,819,353.00	4,985,912.33	2,507,552.00
1967				
January	11,404,048.27	816,048.00	12,220,096.27	11,769,410.78
February	9,924,014.11	728,323.00	10,652,337.11	10,850,089.57
March	10,065,252.63	633,890.00	10,699,142.63	13,672,903.51
April	13,117,218.53	491,192.00	13,608,410.53	14,179,669.82
May	13,448,750.53	678,526.00	14,127,276.53	13,337,223.07
June	14,121,977.34	702,337.00	14,824,314.34	14,830,303.10
F.Y. 1968:				
1967				
July	10,530,074.89	2,903,777.00	13,433,851.89	11,237,870.65
August	9,905,779.65	2,891,464.00	12,797,243.65	11,605,238.65
September	8,768,563.36	2,974,374.00	11,742,937.36	9,873,269.69
October	8,649,259.73	3,978,540.00	12,627,799.73	9,758,954.96
November	9,351,725.53	3,293,825.00	12,645,550.53	6,611,481.53
December	5,042,657.15	3,534,110.00	8,576,767.15	6,577,929.38
1968				
January	7,428,437.62	2,534,580.00	9,963,017.62	7,953,558.95
February	9,142,455.91	919,993.00	10,062,448.91	9,617,864.19
March	10,712,116.45	1,100,303.00	11,812,419.45	11,800,247.74
April	9,183,745.23	3,253,789.00	12,437,534.23	9,647,544.78
May	8,503,666.03	3,233,026.00	11,736,692.03	8,837,172.25
June	8,500,258.94	3,901,559.00	12,401,817.94	8,828,683.06
Monthly Average - Biennium	8,232,553.72	2,467,784.08	10,423,546.36	8,923,052.80

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

HISTORICAL RECORD OF REVENUES, 1917-1968

DESCRIPTION	F.Y. 1917 - 1966	F.Y. 1967	F.Y. 1968	TOTAL FOR F.Y. 67-68 Biennium	TOTAL TO DATE F.Y. 1917-1968
User:					
Fuel Taxes	$ 146,082,961.56	$ 11,863,162.79	$ 12,696,137.26	$ 24,559,300.05	$170,642,261.61
Registration Fees	30,942,651.70	3,303,709.60	3,179,476.05	6,483,185.65	37,425,837.35
Carrier Fees	43,294,123.07	3,298,432.68	3,459,104.79	6,757,537.47	50,051,660.54
Driver's Licences	3,596,369.56	338,935.62	211,767.65	550,703.27	4,147,072.83
Total User	$ 223,916,105.89	$ 18,804,240.69	$ 19,546,485.75	$ 38,350,726.44	$262,266,832.33
Participation By Others:					
Federal Aid	$ 307,737,281.12	$ 42,766,877.00	$ 24,239,389.00	$67,006,266.00	$374,743,547.12
Cities and Counties	5,080,021.96	175,363.38	430,037.68	605,401.06	5,685,423.02
Other Participation	603,242.17	-0-	-0-	-0-	603,242.17
Total Participation by others	$ 313,420,545.25	$ 42,942,240.38	$ 24,669,426.68	$67,611,667.06	$381,032,212.31
Other:					
Miscellaneous	$ 4,075,093.82	$ -0-	$ -0-	$ -0-	$ 4,075,093.82
Accounts Receivable	5,872,196.14	760,949.91	528,349.39	1,289,299.30	7,161,495.44
Total Other	$ 9,947,289.96	$ 760,949.91	$ 528,349.39	$ 1,289,299.30	$ 11,236,589.26
Total - All Revenues	$ 547,283,941.10	$ 62,507,430.98	$ 44,744,261.82	$107,251,692.80	$ 654,535,633.90
Less: Disbursements	$ 514,705,298.57	$ 49,803,920.35	$ 46,669,707.23	$ 96,473,627.58	$ 611,178,926.15
Administrative and Collection Costs	27,403,549.83	3,256,625.99	3,696,272.99	6,952,898.98	34,356,448.81
Fund Transfers	500,000.00	-0-	-0-	-0-	500,000.00
Fund Balance from previous F.Y.	-0-	4,675,092.70	14,121,977.34	4,675,092.70	-0-
Ending Highway Fund Balance	$ 4,675,092.70	$ 14,121,977.34	$ 8,500,258.94	$ 8,500,258.94	$ 8,500,258.94

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

ANTICIPATED REVENUES AVAILABLE, 1968-1969 and 1970-1971 BIENNIUMS

DESCRIPTION	ACTUAL F.Y. 1968	WORK PROGRAM F.Y. 1969	BIENNIUM TOTALS	WORK PROGRAM F.Y. 1970	WORK PROGRAM F.Y. 1971	BIENNIUM TOTALS
FEDERAL AID PARTICIPATION:						
Interstate System	$16,125,395.00	$20,855,625.00	$36,981,020.00	$28,194,000.00	$29,194,000.00	$57,388,000.00
Primary System	4,346,791.00	10,361,723.00	14,708,514.00	7,189,000.00	6,689,000.00	13,878,000.00
Secondary System	2,926,872.00	3,298,094.00	6,224,966.00	5,115,000.00	5,615,000.00	10,730,000.00
Other	840,331.00	639,338.00	1,479,669.00	1,239,000.00	1,239,000.00	2,478,000.00
Sub-Total Federal Aid	$24,239,389.00	$35,154,780.00	$59,394,169.00	$41,737,000.00	$42,737,000.00	$84,474,000.00
City, County, and other Participation	$ 430,037.68	$ 500,000.00	$ 930,037.68	$ 675,000.00	$ 659,000.00	$ 1,334,000.00
HIGHWAY USER:						
Motor Fuel Taxes	$12,696,137.26	$13,529,868.00	$26,226,005.26	$14,072,446.00	$14,779,281.00	$28,851,727.00
Common Carrier Fees	3,459,104.79	3,607,170.00	7,066,274.79	3,781,598.00	3,973,469.00	7,755,067.00
Auto Registrations	3,179,476.05	3,599,183.00	6,778,659.05	3,757,182.00	3,930,980.00	7,688,162.00
Drivers License Fees	211,767.65	449,000.00	660,767.65	503,000.00	365,000.00	868,000.00
Sub-Total Highway User	$19,546,485.75	$21,185,221.00	$40,731,706.75	$22,114,226.00	$23,048,730.00	$45,162,956.00
Miscellaneous Accounts Receivable:	$ 528,349.39	$ 600,000.00	$ 1,128,349.39	$ 775,000.00	$ 758,000.00	$ 1,533,000.00
Total Gross Receipts	$44,744,261.82	$57,440,001.00	$102,184,262.82	$ 65,301,226.00	$67,202,730.00	$132,503,956.00
USER ADMINISTRATIVE COSTS:						
Nevada Tax Commission	$ 35,943.55	$ 47,000.00	$ 82,943.55	$ 49,000.00	$ 50,000.00	$ 99,000.00
Public Service Commission	120,186.00	123,935.00	244,121.00	197,122.00	210,137.00	407,259.00
Department of Motor Vehicles	3,540,143.44	3,702,080.00	7,242,223.44	4,793,687.00	4,784,888.00	9,578,575.00
Total User Administrative Costs	$ 3,696,272.99	$ 3,873,015.00	$ 7,569,287.99	$ 5,039,809.00	$ 5,045,025.00	$10,084,834.00
Net Useable Revenues	$41,047,988.83	$53,566,986.00	$94,614,974.83	$60,261,417.00	$62,157,705.00	$122,419,122.00

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

NEVADA'S SHARE OF FEDERAL AID ALLOTMENTS

1917 - 1969

1917 - 1964	
Primary	$ 96,241,793.63
Secondary	47,194,154.00
Urban	2,698,442.00
Interstate	111,935,143.00
Public Lands	4,999,207.32
"D" Funds	3,839,673.00
Other Federal Funds	27,294,760.69
Sub-Total 1917-1964	$ 294,203,173.64
1965 Primary	$ 4,972,303.00
1965 Secondary	3,307,069.00
1965 Urban	365,358.00
1965 Interstate	13,502,498.00
1965 Public Lands	699,997.00
1966 Primary	4,981,574.00
1966 Secondary	3,313,131.00
1966 Urban	378,120.00
1966 Interstate	14,073,850.00
1966 Public Lands	200,000.00
1966 Other Federal Funds	403,081.00
1967 Primary	4,984,671.00
1967 Secondary	3,315,193.00
1967 Urban	377,163.00
1967 Interstate	18,616,500.00
1967 Other Federal Funds	511,419.00
1968 Primary	5,013,559.00
1968 Secondary	3,334,432.00
1968 Urban	378,694.00
1968 Interstate	21,184,380.00
1969 Primary	4,984,092.00
1969 Secondary	3,314,806.00
1969 Urban	378,120.00
1969 Interstate	23,640,750.00
Sub-Total 1965-1969	$ 136,230,760.00
GRAND TOTAL 1917 -1969	$ 430,433,933.64

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

HISTORICAL RECORD OF FEDERAL PARTICIPATION

1917 - 1968

FISCAL YEAR	CONSTRUCTION, CONSTRUCTION ENGINEERING	RESEARCH & INVESTIGATION (PLANNING)	RIGHT OF WAY	PRELIMINARY ENGINEERING	TOTAL FEDERAL AID
1917-1958	$ 118,009,879.68	$ 1,426,704.31	$ 356,740.00	$ -0-	$ 119,793,323.99
1959	14,045,714.55	318,858.00	56,254.00	760,069.00	15,180,895.55
1960	9,839,696.58	247,917.00	365,627.00	864,065.00	11,317,305.58
1961	10,948,751.00	485,171.00	316,045.00	501,271.00	12,251,238.00
1962	14,230,517.00	376,774.00	301,124.00	755,569.00	15,663,984.00
1963	16,021,340.00	354,751.00	1,461,770.00	467,671.00	18,305,532.00
1964	28,129,856.00	324,394.00	4,394,288.00	1,771,232.00	34,619,770.00
1965	34,676,786.00	278,120.00	7,057,811.00	3,019,165.00	45,031,882.00
1966	22,262,042.00	269,222.00	10,096,286.00	2,945,800.00	35,573,350.00
1967	26,330,722.00	444,739.00	14,235,640.00	1,755,776.00	42,766,877.00
1968	19,927,176.00	322,178.00	3,086,335.00	903,700.00	24,239,389.00
	$ 314,422,480.81	$ 4,848,828.31	$41,727,920.00	$13,744,318.00	$ 374,743,547.12

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

FEDERAL FUNDS RECEIVED
BY SYSTEM TYPE AND CLASS OF FUNDS

DESCRIPTION	1964	1965	1966	1967	1968	TOTAL FIVE YEARS
Interstate System Funds						
Right of Way	$ 3,779,838.00	$ 6,174,807.00	$ 8,558,946.00	$11,665,345.00	$ 2,692,371.00	$32,871,307.00
Preliminary Engineering	1,168,956.00	2,093,429.00	1,971,571.00	1,229,608.00	524,950.00	6,988,514.00
Construction	14,279,561.00	20,854,537.00	12,669,605.00	16,811,645.00	11,696,917.00	76,312,265.00
Construction Engineering	2,256,126.00	1,866,578.00	1,527,020.00	1,760,342.00	1,211,157.00	8,621,223.00
TOTAL INTERSTATE FUNDS	$21,484,481.00	$30,989,351.00	$24,727,142.00	$31,466,940.00	$16,125,395.00	$124,793,309.00
Primary System Funds						
Right of Way	$ 367,331.00	$ 464,178.00	$ 1,184,525.00	$ 1,550,546.00	$ 277,299.00	$ 3,843,879.00
Preliminary Engineering	312,589.00	617,007.00	633,742.00	265,867.00	246,062.00	2,075,267.00
Construction	7,906,740.00	7,790,413.00	2,624,108.00	3,380,932.00	3,319,790.00	25,021,983.00
Construction Engineering	853,299.00	392,488.00	373,691.00	555,944.00	503,640.00	2,679,062.00
TOTAL PRIMARY FUNDS	$ 9,439,959.00	$ 9,264,086.00	$ 4,816,066.00	$ 5,753,289.00	$ 4,346.791.00	$33,620,191.00
Secondary System Funds						
Right of Way	$ 94,953.00	$ 288,043.00	$ 329,503.00	$ 703,097.00	$ 80,216.00	$ 1,495,812.00
Preliminary Engineering	282,798.00	306,765.00	317,594.00	260,301.00	128,908.00	1,296,366.00
Construction	2,338,483.00	3,014,478.00	4,185,439.00	3,256,323.00	2,362,336.00	15,157,059.00
Construction Engineering	224,153.00	414,816.00	461,045.00	413,202.00	355,412.00	1,868,628.00
TOTAL SECONDARY FUNDS	$ 2,940,387.00	$ 4,024,102.00	$ 5,293,581.00	$ 4,632,923.00	$ 2,926,872.00	$19,817,865.00
Urban System Funds						
Right of Way	$ 152,166.00	$ 130,783.00	$ 23,312.00	$ 316,652.00	$ 36,449.00	$ 659,362.00
Preliminary Engineering	6,889.00	1,964.00	22,893.00	-0-	3,780.00	35,526.00
Construction	253,715.00	309,470.00	383,061.00	109,453.00	463,146.00	1,518,845.00
Construction Engineering	17,779.00	34,006.00	38,073.00	42,881.00	14,778.00	147,517.00
TOTAL URBAN FUNDS	$ 430,549.00	$ 476,223.00	$ 467,339.00	$ 468,986.00	$ 518,153.00	$ 2,361,250.00
Highway Planning (1½%) Funds	$ 324,394.00	$ 278,120.00	$ 269,222.00	$ 444,739.00	$ 322,178.00	$ 1,638,653.00
GRAND TOTALS	$34,619,770.00	$45,031,882.00	$35,573,350.00	$42,766,877.00	$24,239,389.00	$182,231,268.00

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

ESTIMATED DISBURSEMENTS OF THE HIGHWAY DEPARTMENT FOR THE
1970-1971 BIENNIUM WITH COMPARISONS TO THE 1968-1969

	1968 Actual	1969 Work Program	Biennium Totals	1970 Agency Request	1971 Agency Request	Estimated Biennium Totals
DISBURSEMENTS:						
Construction & Engineering						
Federal (By Reimbursement)						
Right of Way	$ 3,086,335.00	$ 5,663,279.00	$ 8,749,614.00	$ 5,879,000.00	$ 6,133,000.00	$12,012,000.00
Preliminary Engineering	903,700.00	1,072,602.00	1,976,302.00	1,113,000.00	1,161,000.00	2,274,000.00
Construction Engineering	2,084,687.00	2,474,315.00	4,559,002.00	2,568,000.00	2,680,000.00	5,248,000.00
Construction	17,842,189.00	21,176,894.00	39,019,083.00	21,982,000.00	22,938,000.00	44,920,000.00
Planning (Research & Investigation)	322,178.00	382,393.00	704,571.00	397,000.00	414,000.00	811,000.00
Sub-Total	$24,239,089.00	$30,769,483.00	$55,008,572.00	$31,939,000.00	$33,326,000.00	$65,265,000.00
State (Matching)						
Right of Way	$ 3,704,138.65	$ 2,396,443.00	$ 6,100,581.65	$ 2,488,000.00	$ 2,598,000.00	$ 5,086,000.00
Preliminary Engineering	1,271,582.55	1,653,637.00	2,925,219.55	1,717,000.00	1,792,000.00	3,509,000.00
Construction Engineering	1,197,110.59	1,455,383.00	2,652,493.59	1,511,000.00	1,576,000.00	3,087,000.00
Construction	5,447,822.27	6,287,572.00	11,735,394.27	6,527,000.00	6,811,000.00	13,338,000.00
Planning (Research Investigation)	168,257.54	199,712.00	367,969.54	207,000.00	216,000.00	423,000.00
Sub-Total	$11,788,911.60	$11,992,747.00	$23,781,658.60	$12,450,000.00	$12,993,000.00	$25,443,000.00
Sub-Total Construction & Engineering	$36,028,000.60	$42,762,230.00	$78,790,230.60	$44,389,000.00	$46,319,000.00	$90,708,000.00
Maintenance						
Routine Roadway	$ 1,456,513.18	$ 1,728,755.00	$ 3,185,268.18	$ 1,794,000.00	$ 1,872,000.00	$ 3,666,000.00
Special Surface	128,592.53	152,628.00	281,220.53	159,000.00	166,000.00	325,000.00
Shoulders & Approaches	246,118.81	292,122.00	538,240.81	303,000.00	316,000.00	619,000.00
Roadside & Drainage	1,799,145.27	2,135,425.00	3,934,570.27	2,216,000.00	2,312,000.00	4,528,000.00
Traffic Services	1,600,647.69	1,899,817.00	3,500,464.69	1,972,000.00	2,058,000.00	4,030,000.00
Snow & Ice	767,416.67	910,858.00	1,678,274.67	946,000.00	987,000.00	1,933,000.00
Structures	36,245.67	43,020.00	79,265.67	45,000.00	47,000.00	92,000.00
Emergency - Floods, etc.	111,867.73	132,775.00	244,642.73	138,000.00	144,000.00	282,000.00
Sub-Total Maintenance	$ 6,146,547.55	$ 7,295,400.00	$13,441,947.55	$ 7,573,000.00	$ 7,902,000.00	$15,475,000.00
Administration						
General Administration	$ 219,062.82	$ 260,009.00	$ 479,071.82	$ 270,000.00	$ 282,000.00	$ 552,000.00
Buildings (Includes Contracts)	189,494.71	224,914.00	414,408.71	233,000.00	243,000.00	476,000.00
Public Hearings	21,778.14	25,849.00	47,627.14	27,000.00	28,000.00	55,000.00
General Office (Headquarters)	1,452,121.52	1,723,545.00	3,175,666.52	1,789,000.00	1,867,000.00	3,656,000.00
Highways & Parks Magazine	128,914.37	153,010.00	281,924.37	159,000.00	166,000.00	325,000.00
State Road Map	31,784.45	37,725.00	69,509.45	39,000.00	41,000.00	80,000.00
Public Relations	254,454.74	302,016.00	556,470.74	313,000.00	327,000.00	640,000.00
Special Traffic Studies	186,374.65	221,211.00	407,585.65	230,000.00	240,000.00	470,000.00
Equipment, Plants & Stock	866,132.97	1,028,026.00	1,894,158.97	1,067,000.00	1,113,000.00	2,180,000.00
Headquarters Office Building	185,887.36	220,632.00	406,519.36	229,000.00	239,000.00	468,000.00
Reimburseable Expenditures	959,153.35	1,138,433.00	2,097,586.35	1,182,000.00	1,233,000.00	2,415,000.00
Sub-Total Administration	$ 4,495,159.08	$ 5,335,370.00	$ 9,830,529.08	$ 5,538,000.00	$ 5,779,000.00	$11,317,000.00
GRAND TOTAL	$46,669,707.23	$55,393,000.00	$102,062,707.23	$57,500,000.00	$60,000,000.00	$117,500,000.00

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

COMPARISON THE LAST TEN YEAR PERIOD
CONSTRUCTION & ENGINEERING EXPENDITURES

PERIOD (FISCAL YR)	CONTRACTORS PAYMENTS	CONSTRUCTION ENGINEERING	PRELIMINARY ENGINEERING	RIGHT OF WAY (INCLUDES ACQUISITION)	SUB TOTAL	STATE CONST., ADDITIONS & BETTERMENTS	RESEARCH & INVEST. (PLANNING)	TOTAL CONST. & ENGINEERING
1959	$16,986,542.21	$1,645,073.81	$1,091,190.26	$ 515,056.95	$20,237,863.23	$ 315,163.03	$440,557.37	$20,993,583.63
1960	9,509,236.61	1,147,603.58	1,494,399.38	1,202,330.73	13,353,570.30	358,700.49	505,856.98	14,218,127.77
1961	11,067,884.63	1,401,860.62	1,616,167.39	861,184.07	14,947,096.71	552,478.19	476,134.93	15,975,709.83
1962	15,174,577.23	1,880,994.87	1,715,583.89	1,488,413.98	20,259,569.97	576,260.15	508,255,68	21,344,085.80
1963	17,569,098.09	2,366,989.79	1,957,184.48	1,979,684.52	23,872,956.88	782,869.81	503,144.05	25,158,970.74
1964	29,480,587.62	3,782,837.13	2,499,803.66	5,860,308.07	41,623,536.48	779,091.88	630,375.15	43,033,003.51
1965	37,519,172.58	4,077,274.87	1,707,386.64	8,520,012.55	51,823,846.64	812,737.47	609,425.10	53,246,009.21
1966	21,229,905.12	3,027,107.50	2,544,180.57	15,398,353.90	42,199,547.09	1,048,803.02	628,472.84	43,876,822.95
1967	23,038,982.04	3,090,089.41	1,980,312.37	11,100,977.68	39,210,361.50	1,140,046.29	669,789.81	41,020,197.60
1968	22,340,825.12	3,318,971.59	2,175,282.55	6,790,473.65	34,625,552.91	1,101,506.86	676,810.19	36,403,869.96

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

COMPARISON OF EXPENDITURES FOR VARIOUS MAINTENANCE
OPERATIONS ON ALL ROADS MAINTAINED BY THE DEPARTMENT

	F.Y. 1967	F.Y. 1968	TOTAL	PERCENT
Routine Roadway Operations:				
Patching holes & ruts, spot sealing	$ 812,844.54	$ 667,652.32	$ 1,480,496.86	
Removal of Debris & loose material	57,692.62	87,713.38	145,406.00	
Maintaining loose surface roads	13,373.30	5,210.61	18,583.91	
Filling & trimming joints & cracks	128,527.46	152,048.53	280,575.99	
Applying light seal & blotter	666,443.40	543,694.23	1,210,137.63	
Maintaining concrete surfaces	749.50	194.11	943.61	
SUB-TOTAL	$ 1,679,630.82	$ 1,456,513.18	$ 3,136,144.00	26.76
Special Roadway Operations:				
Replacement of gravel	$ 252.15	$ -0-	$ 252.15	
Reprocessing Bituminous surfaces	15,644.66	9,321.29	24,965.95	
Light roadmixing & major patching	41,581.04	119,271.24	160,852.28	
SUB-TOTAL	$ 57,477.85	$ 128,592.53	$ 186,070.38	1.59
Shoulders & Approaches				
Shoulder patching & m nor washouts	$ 94,833.50	$ 81,353.99	$ 176,187.49	
Removal of debris & loose material	30,028.76	59,307.35	89,336.11	
Bituminous shoulder treatment	68,537.97	69,461.46	137,999.43	
Reprocessing bituminous shoulders	34,248.56	35,996.01	70,244.57	
SUB-TOTAL	$ 227,648.79	$ 246,118.81	$ 473,767.60	4.04
Roadside & Drainage:				
Repair of cuts, fills, slopes	$ 519,096.95	$ 701,119.27	$ 1,220,216.22	
Cleaning, retrenching drains	193,847.47	297,318.26	491,165.73	
Removal of weeds	218,721.61	312,779.52	531,501.13	
Removal of debris	318,914.40	299,571.03	618,485.43	
Chemical weed control	30,831.97	61,467.55	92,299.52	
Roadside landscaping	23,759.28	50,108.75	73,868.03	
Maintenance of fence, cattle guards	67,519.72	76,780.89	144,300.61	
SUB-TOTAL	$ 1,372,691.40	$ 1,799,145.27	$ 3,171,836.67	27.07
Traffic Services:				
Repairs to signs, safety devices	$ 381,145.92	$ 475,688.77	$ 856,834.69	
Removal of advertising signs	5,744.79	1,840.79	7,585.58	
Repairs to guide posts	255,700.97	276,647.26	532,348.23	
Traffic lane & center striping	360,309.52	463,945.69	824,255.21	
Maintenance of guard rails	67,460.23	85,675.33	153,135.56	
Highway & structure lighting	22,869.12	54,360.43	77,229.55	
Maintenance of roadside rests	65,909.83	87,575.42	153,485.25	
Pedestrian crossing markings	60,319.13	63,891.07	124,210.20	
Patrolling for public safety	117,281.96	91,022.93	208,304.89	
SUB-TOTAL	$ 1,336,741.47	$ 1,600,647.69	$ 2,937,389.16	25.07
Snow, Ice & Sand Control:				
Snow fence & markers	$ 46,622.26	$ 61,981.41	$ 108,603.67	
Removal of snow & ice	473,671.74	410,133.72	883,805.46	
Sanding & salting icy surfaces	217,999.65	282,879.13	500,878.78	
Open waterways & drains	6,876.78	7,729.72	14,606.50	
Removal of Sand drifts	11,136.46	4,562.56	15,699.02	
Maintain Road Blockades	827.21	130.13	957.34	
SUB-TOTAL	$ 757,134.10	$ 767,416.67	$ 1,524,550.77	13.01
Structures:				
Cleaning, opening channels	$ 8,858.60	$ 12,422.13	$ 21,280.73	
Repairs to structures	4,799.73	12,431.67	17,231.40	
Maintenance of structures	1,278.15	8,011.16	9,289.31	
Maintenance of pumping plants	1,714.41	757.35	2,471.76	
Bridge & Culvert Inspection	1,692.01	2,623.36	4,315.37	
SUB-TOTAL	$ 18,342.90	$ 36,245.67	$ 54,588.57	.46
Special Maintenance:				
Floods, washouts, extraordinary	$ 122,422.42	$ 111,867.73	$ 234,290.15	2.00
TOTAL MAINTENANCE	$ 5,572,089.75	$ 6,146,547.55	$11,718,637.30	100.00
Total Miles Maintained	4,775.749	4,826.899		
Average Cost per Mile with Snow Removal	$ 1,166.74	$ 1,273.39		
Average Cost per Mile without Snow Removal	1,008.20	984.85		

STATE OF NEVADA - DEPARTMENT OF HIGHWAYS

MAINTENANCE & SNOW REMOVAL COSTS

1918 - 1968

FISCAL PERIOD	SNOW REMOVAL	GENERAL MAINTENANCE	TOTAL	MILEAGE MAINTAINED	AVERAGE COST PER MILE
1918 - 1926	$ 16,862.47	$ 963,132.32	$ 979,994.79		
1927 - 1936	306,626.06	4,670,275.03	4,976,901.09		
1937 - 1946	811,702.44	7,464,889.04	8,276,591.48		
1947 - 1956	2,613,958.78	16,411,246.55	19,025,205.33		
Sub-Total (1918 - 1956)	$ 3,749,149.75	$ 29,509,542.94	$ 33,258,692.69		
1957	$ 263,686.02	$ 2,504,661.04	$ 2,768,347.06	4,166.47 Mi.	$ 664.44
1958	430,682.84	2,879,731.76	3,310,414.60	4,303.89 Mi.	769.17
1959	312,084.25	3,150,505.89	3,462,590.14	4,376.21 Mi.	791.23
1960	482,449.72	3,497,714.05	3,980,163.77	4,452.98 Mi.	893.82
1961	310,367.40	3,610,168.69	3,920,536.09	4,487.71 Mi.	873.62
1962	654,463.11	3,957,520.30	4,611,983.41	4,500.80 Mi.	1,024.70
1963	315,461.03	3,995,972.52	4,311,433.55	4,554.06 Mi.	946.72
1964	592,420.49	4,191,246.58	4,783,667.07	4,625.02 Mi.	1,034.30
1965	563,915.93	4,088,110.70	4,652,026.63	4,706.45 Mi.	988.44
1966	638,541.72	4,579,883.32	5,218,425.04	4,718.22 Mi.	1,106.01
1967	757,134.10	4,814,955.65	5,572,089.75	4,775.75 Mi.	1,166.74
1968	767,416.67	5,379,130.88	6,146,547.55	4,826.90 Mi.	1,273.39
Sub-Total (1957 - 1968)	$ 6,088,623.28	$ 46,649,601.38	$ 52,738,224.66		
Total (1918 - 1968)	$ 9,837,773.03	$ 76,159,144.32	$ 85,996,917.35		

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